PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

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Emerson. 1232 - (Ch - 120331-H)
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CBS-COLUMBIA MODELS C220, C230, C231, C232, C240 (Ch. 616, 636, 656)

PROPERTY OF
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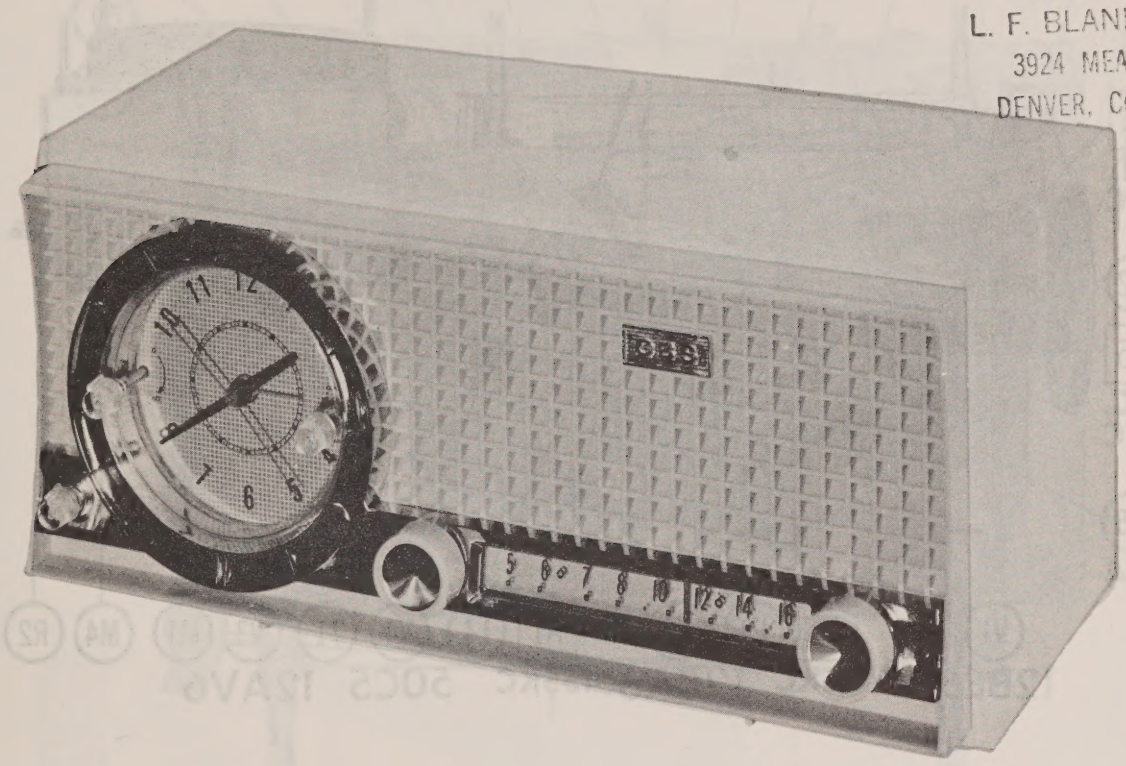
DENVER, COLORADO

CBS-COLUMBIA MODELS C220, C230, C231, C232, C240 (Ch. 616, 636, 656)



CBS-COLUMBIA MODELS C220, C230, C231, C232, C240 (Ch. 616, 636, 656)

TRADE NAME	CBS-Columbia Models C220 (Ch. 656), C230, C231, C232 (Ch. 636), C240 (Ch. 616)
MANUFACTURER	CBS-Columbia, Div. of Columbia Broadcasting System, Inc., 48-50 34th St., Long Island City, N. Y.
TYPE SET	AC Operated AM Superheterodyne Receiver With Electric Clock
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles
RATING	.30 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to pin 1 (grid) of 12BA6 (V2). Low side to B-.	455KC (400% Mod)	Tuning gang fully open.	Across voice coil.	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	"	"	"	A3, A4	"
3.	"	"	1620KC	"	"	A5	"
4.		Loop	1400KC	Tune to 1400KC signal.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det-AVC-AF Amp.	12AV6	
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA CBS-Columbia PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	70	150	21001181	PRS150V4080	BBRD8415	TCD498	TDLD-11	FMT-1540	TVA-3451
B	40	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA CBS-Columbia PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.047	400	22011740	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	Note 1.
C3	.047	400	22011740	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C4	.022	400	22011700	BPD-02	DF-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C5	.047	400	22011740	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C6	.1	400	22026280	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	

Note 1. Used only in chassis 616

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA CBS-Columbia PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	36001652	AB-60	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	Attach to R1A
R2	5Ω	2	36001691					Pilot Light Dimmer (Note 1)

Note 1: Used in chassis 616 only.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA CBS-Columbia PART No.	IRC PART No.	NOTES
R3	22K		30223230	BTS-22K	
R4	3.3Meg		30335330	BTS-3.3Meg	
R5	120Ω		30121230	BTS-120	
R6	150Ω		30151230	BTS-150	
R7	1000Ω	1	30102240	BTS-1000	Note 1

Note 1: 1500Ω 1W (part #30152240) used in chassis 656 only.

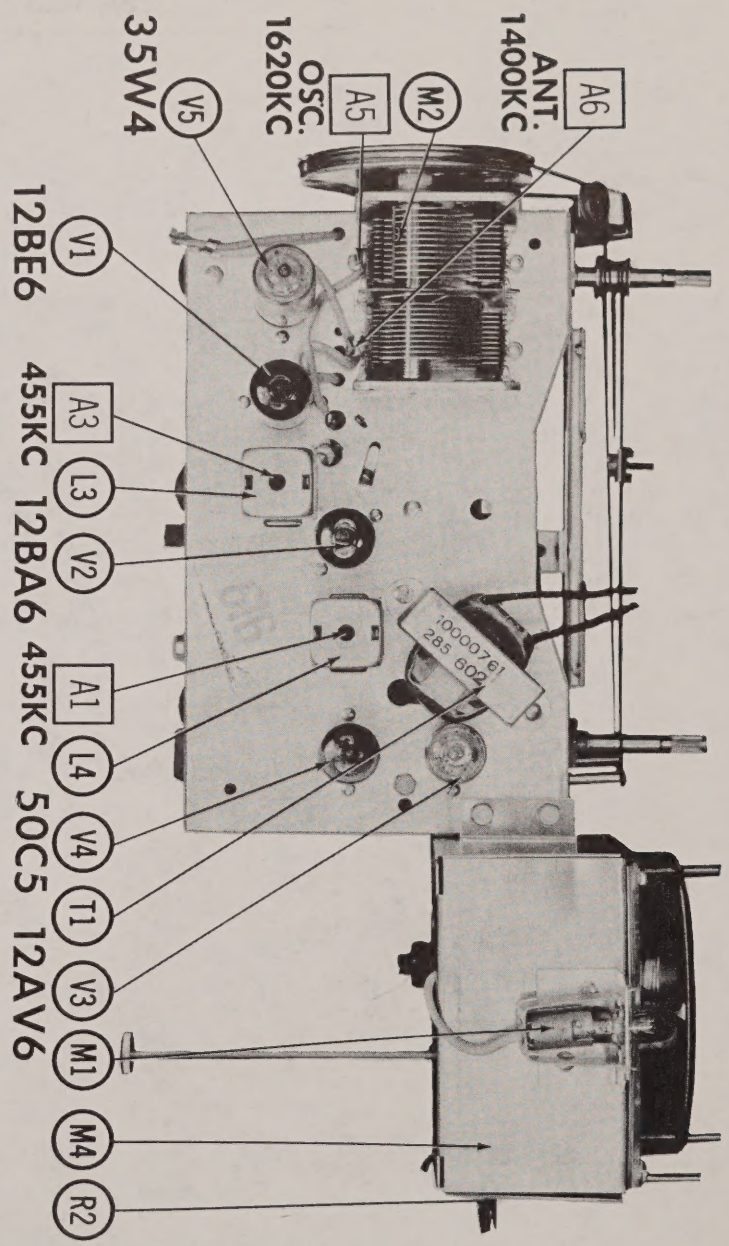
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA CBS-Columbia PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2.3K	3-4Ω	10000761	Z1103	A-3031	A-3336	24S50A	S-16X	

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA CBS-Columbia PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	4" X 6"	PM	3-4Ω	73001191	46A1 ①	227S1 ①	① Fabricate mounting.
	4"	PM	3-4Ω	73001162 ②			② Includes audio output trans. used in chassis 656.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: CBS-Columbia PART No.	REPLACEMENT DATA: MEISSNER PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: MILLER PART No.	NOTES
L1	Loop Ant.	3.3Ω		79000341				Chassis 616 (Note 1)
L2	Osc. Coil	.8Ω	10Ω	15000782				
L3	Input IF	17Ω	17Ω	12000281	16-6758	BC-352	12-C1	
L4	Output IF	17Ω	17Ω	12000281	16-6758	BC-353	12-C2	

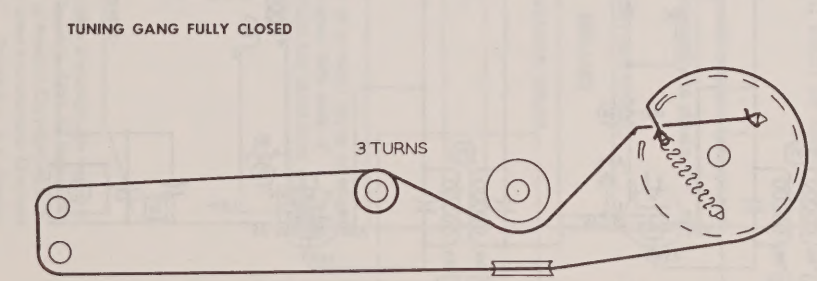
Note 1: Part #79000343 used in chassis 656.
Part #79000342 used in chassis 636.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	CBS-Columbia PART No.	REPLACEMENT DATA	
K1	Audio Couplate	6.8Meg., 470K, 470K, 220MMF.; 2000MMF., 5000MMF., 500MMF.	82000151	Aerovox Centralab Cornell-Dubilier Erie Sprague	PA-113-3 PC-154 DT-3

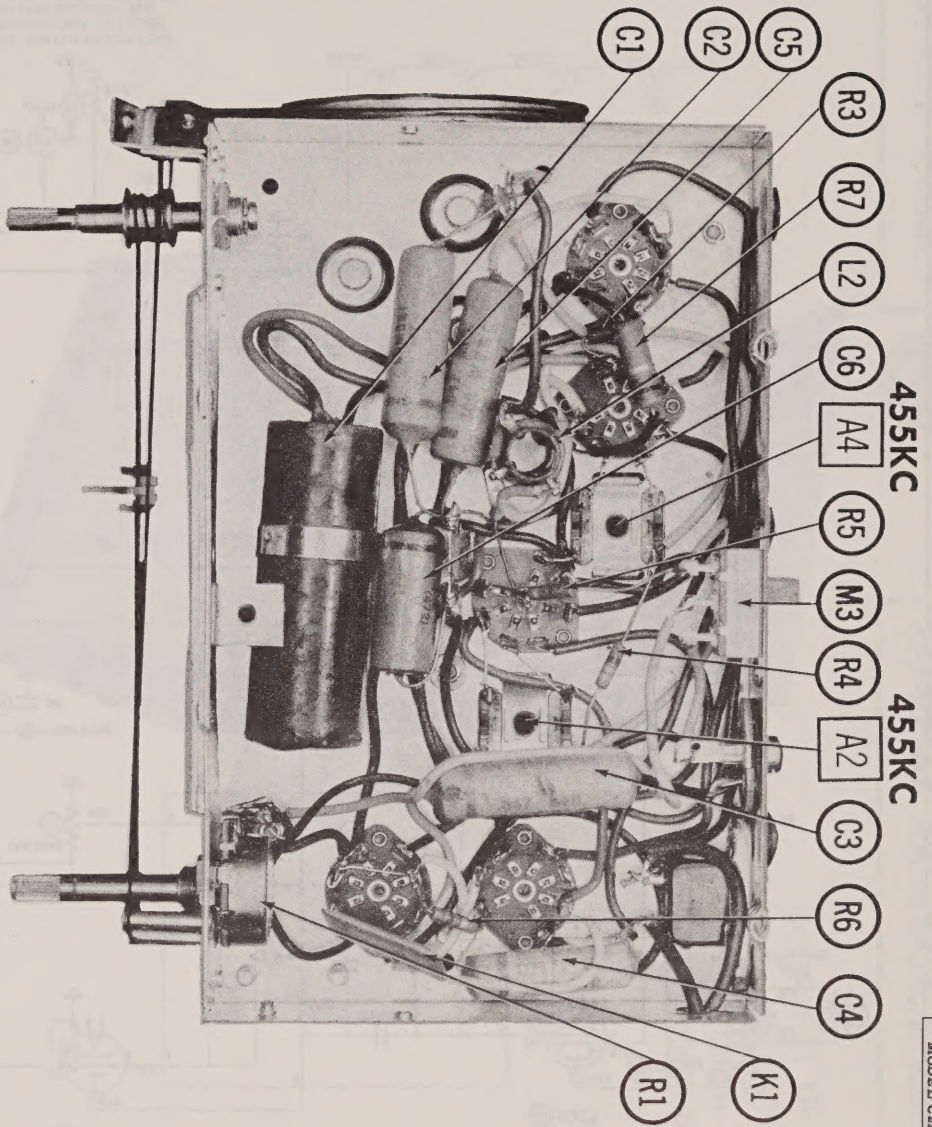
MISCELLANEOUS

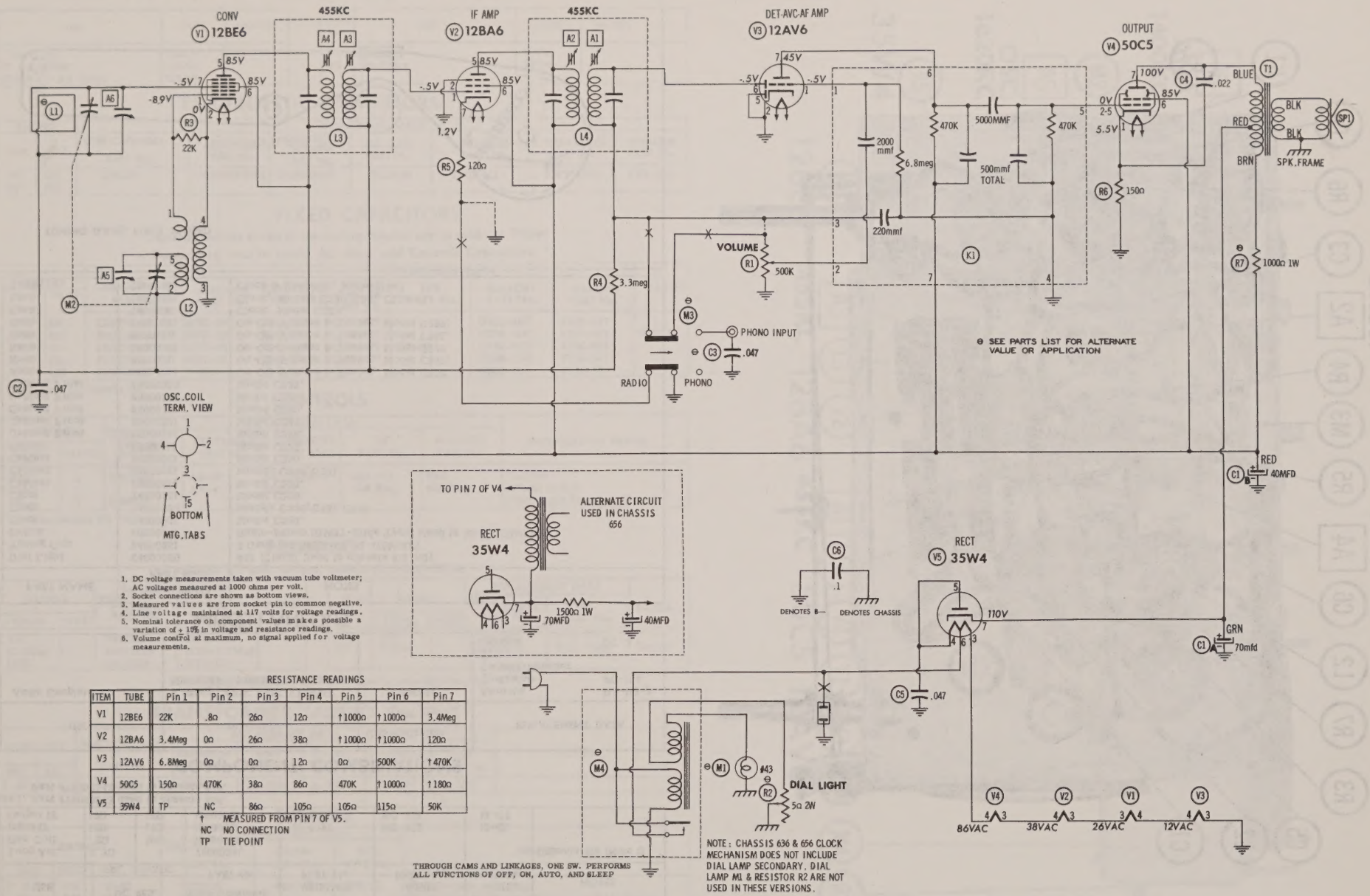
ITEM No.	PART NAME	CBS-Columbia PART No.	NOTES
M1	Dial Light	64000060	#43 (Clock) Used in chassis 616 only.
M2	Tuning Cap.	24000251	2 Gang (24-380MMF, 32-175MMF)
M3	Switch	40000341	Radio-Phono (DPDT-Slide Type) Used in Model C240 only.
M4	Clock	74000531	Model C240.
	Clock	74000532	Models C230, C231, C232.
	Clock	74000551	Model C220.
	Cabinet	88000314	Model C220.
	Cabinet	88000313	Models C240, C231.
	Cabinet	88000312	Model C230.
	Cabinet	88000311	Model C232.
	Cabinet Front	88000341	Model C220.
	Cabinet Front	88000321	Model C240.
	Cabinet Front	88000331	Model C230.
	Cabinet Front	88000332	Model C231.
	Cabinet Front	88000333	Model C232.
	Knob	76004194	On-Off-Volume & Tuning, Model C220.
	Knob	76004181	On-Off-Volume & Tuning, Model C240.
	Knob	76004192	On-Off-Volume & Tuning, Model C230.
	Knob	76004191	On-Off-Volume & Tuning, Model C231.
	Knob	76000193	On-Off-Volume & Tuning, Model C232.
	Knob	76004161	Clock, Model C220.
	Knob	76004931	Clock, Models C230, C231, C232.
	Knob	76000931	Clock & Rheostat, Model C240.



DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW





⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.8Ω	26Ω	12Ω	†1000Ω	†1000Ω	3.4Meg
V2	12BA6	3.4Meg	0Ω	26Ω	38Ω	†1000Ω	†1000Ω	120Ω
V3	12AV6	6.8Meg	0Ω	0Ω	12Ω	0Ω	500K	†470K
V4	50C5	150Ω	470K	38Ω	86Ω	470K	†1000Ω	†180Ω
V5	35W4	TP	NC	86Ω	105Ω	105Ω	115Ω	50K

† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION
TP TIE POINT

NOTE: CHASSIS 636 & 656 CLOCK MECHANISM DOES NOT INCLUDE DIAL LAMP SECONDARY. DIAL LAMP M1 & RESISTOR R2 ARE NOT USED IN THESE VERSIONS.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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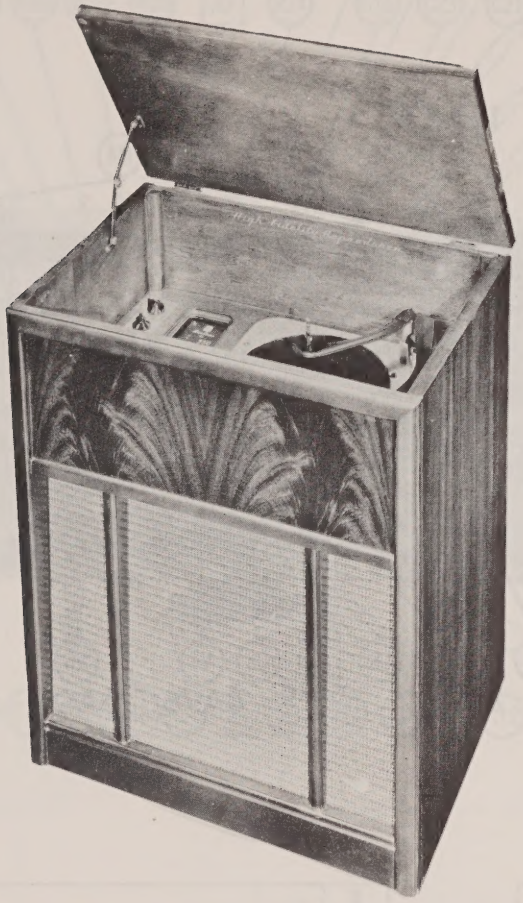
CORONADO MODELS RA1-9243A, RA1-9244A, RA1-9245A, B, RA1-9246A, B



CORONADO MODELS RA1-9243A, RA1-9244A, RA1-9245A, B, RA1-9246A, B

TRADE NAME	Coronado Models RA1-9243A, RA1-9244A, RA1-9245A, RA1-9245B, RA1-9246A, RA1-9246B
SUPPLIER	Gamble-Skogmo, Inc., 15 N. 8th. St., Minneapolis, Minn.
TYPE SET	AC Operated AM-Phono Combination Superheterodyne Receiver
TUBES (Eight)	Types: 6BA6 RF Amp., 6BE6 Converter, 6BA6 IF Amp., 6AV6 Det.-AVC-AF Amp., 12AX7 AF Amp.-Phase Inv., (2) 6AQ5 Output, 5Y3GT Rectifier
POWER SUPPLY	105-120 Volts AC-60 Cycles — RATING .56 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1620KC	"	"	A5	"
3.	"	High side to pin 1 (grid) of 6BA6 (V1). Low side to chassis.	1400KC	Tune to 1400KC signal	"	A6	"
4.		Loop	"	"	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

FOR SERVICE INFORMATION ON 3 SPEED AUTOMATIC RECORD CHANGER - SEE SIMILAR V-M MODEL 954B - PHOTOFACT SET 302 - FOLDER 12.
FOR SERVICE INFORMATION ON 4 SPEED AUTOMATIC RECORD CHANGER - SEE SIMILAR V-M MODEL 1200 - PHOTOFACT SET 290- FOLDER 11 OR RECORD CHANGER MANUAL CM-7.

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PARTS LIST AND DESCRIPTIONS

CORONADO
MODEL RA1-9243A

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		CORONADO PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BA6	6BA6	7BK	
V4	Det.-AVC-AF Amp.	6AV6	6AV6	7BT	
V5	AF Amplifier-Phase Inverter	12AX7	12AX7	9A	
V6	Audio Output	6AQ5	6AQ5	7BZ	
V7	Audio Output	6AQ5	6AQ5	7BZ	
V8	Rectifier	5Y3GT	5Y3GT	5T	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	CORONADO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	350	45X415	AFH3-43	CO34	FP376.8	TMT-38	T-165	TVL-3785
B	■40	350							
C	▲10	350							
C2	5	10	45X426 (Note 1)			TC22 * TC22	TD-5-10NP	MTD-0210 †	

Note 1. Item C2 is a non-polarized unit.
* Connect negative leads together.
† Use positive leads only.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	CORONADO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	.01	200		BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C4	.047	200	RCP10W4473M	BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C5	.022	400	RCP10W4223M	BPD-02	DF-203	CUB4S22	817-02	PT4122	4TM-S22	
C6	470		47X622	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C7	33		47X612	N750-SI33	TCN-33	TN10	N750K-330		5TCU-Q33	
C8	.047	400	RCP10W4473M	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C9	.047	400	RCP10W2473M	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C10A	50		♦76X1	♦PA-99	♦PC-52	♦111TM3	♦1403-03	UC-545	♦D-3	
B	50							UC-545		
C11	470		47X622	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C12	22		47X627	SI22	D6-220	TP22	GP1K-220	UC-5422	5GA-Q22	
C13	.047	200	RCP10W2473M	BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C14	.0047	600	RCP10W2472M	SI4700	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C15	180	500		NP0-SI180	TCZ-180	5R5T18	NP0-334-181		MS-318	
C16	.022	400	RCP10W4223M	BPD-02	DF-203	CUB4S22	817-02	PT4122	4TM-S22	
C17	330		47X624	SI330	D6-331	TP43	GP2K-331	UC-5333	5GA-T33	
C18	.0047	600	RCP10W2472M	SI4700	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C19	.0047	600	RCP10W2472M	SI4700	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C20	1500			SI1500	D6-152	TP54	GP2L-152	UC-5215	5HK-D15	
C21	.022	400	RCP10W4223M	BPD-02	DF-203	CUB4S22	817-02	PT4122	4TM-S22	
C22	.022	400	RCP10W4223M	BPD-02	DF-203	CUB4S22	817-02	PT4122	4TM-S22	
C23	.0022	1000	RCP10M10222M	HVD-15-2200	DD-202	CUB16D22	IR5KV-222	PT16222	10TM-D22	
C24	.0022	1000	RCP10M10222M	HVD-15-2200	DD-202	CUB16D22	IR5KV-222	PT16222	10TM-D22	

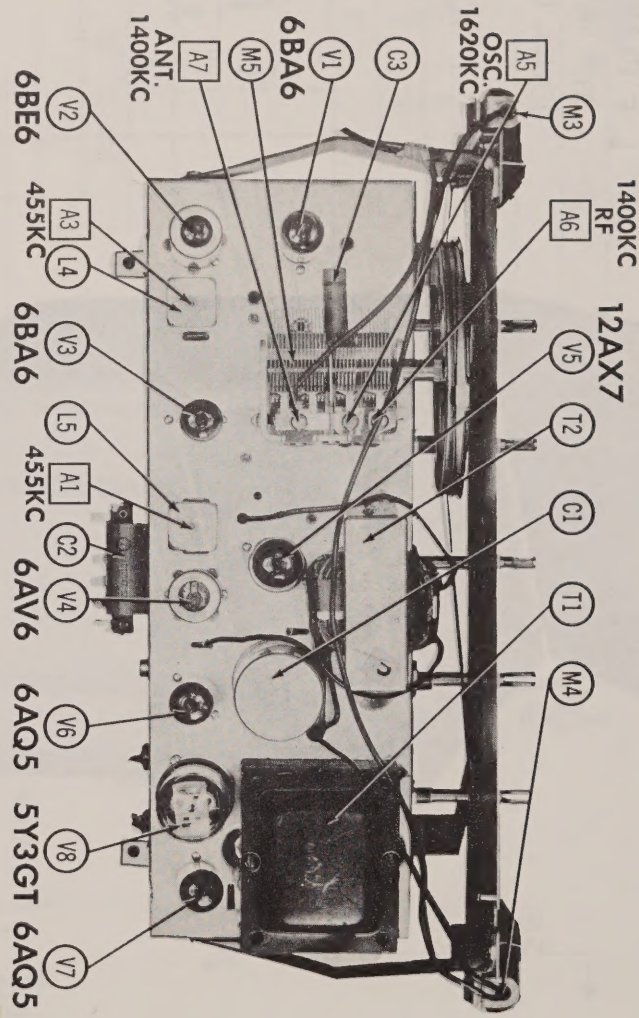
♦ Items C10A, C10B and R15 are combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	CORONADO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½	40X403	AB-70	A47-1Meg-Z	Q13-137	U-53	Bass - Note 1
B	Shaft		Not Req.	AK-4	KSS-3	Note Req.	Not Req.	Attach to R1A
R2A	500KΩ	½	40X404	AB-60	A47-500K-Z	Q13-133	U-48	Treble - Note 2
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R2A
C	Switch		Not Req.	KB-1	SWE-12	76-1	US-26	Attach to R2A
R3A	2Meg	½	36X392	ABT-79	A47F6-2Meg	Q13-139X	UT-449	Loudness tap @ 500KΩ
B	Shaft		Not Req.	AK-4	KSS-4	Not Req.	Not Req.	Attach to R3A

Note 1. Part number 40X419 used in Models RA1-9243A, RA1-9244A. Part number 40X411 (200K) used in Models RA1-9245B, -9246B
Note 2. Part number 40X418 used in Models RA1-9243A, RA1-9244A

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA CORONADO PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R4	3.3Meg	½		BTS-3.3Meg	
R5	47KΩ	½		BTS-47K	
R6	330KΩ	½		BTS-330K	
R7	100KΩ	½		BTS-100K	
R8	100Ω	½		BTS-100	
R9	47Ω	½		BTS-47	
R10	39KΩ	½		BTS-39K	
R11	33KΩ	1		BTA-33K	
R12	2.2Meg	½		BTS-2.2Meg	
R13	33KΩ	1		BTA-33K	
R14	330Ω	½		BTS-330	
R15	47KΩ	½	♦76X1	BTS-47K	
R16	100KΩ	½		BTS-100K	
R17	68KΩ	½	B84683	BTS-68K	
R18	10Meg	½		BTS-10Meg	
R19	270KΩ	½		BTS-270K	
R20	2.2Meg	½		BTS-2.2Meg	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA CORONADO PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R21	470KΩ	½		BTS-470K	
R22	33KΩ	½		BTS-33K	
R23	180KΩ	½		BTS-180K	
R24	100KΩ	½		BTS-100K	
R25	2200Ω	½		BTS-2200	
R26	470Ω	½		BTS-470	
R27	120KΩ	½		BTS-120K	
R28	100KΩ	½		BTS-100K	
R29	120KΩ	½		BTS-120K	
R30	470Ω	½		BTS-470	
R31	220KΩ 5%	½		BTS-220K 5%	
R32	7500Ω 5%	½	B83752	BTS-7500 5%	
R33	220KΩ	½		BTS-220K	
R34	220Ω	2			
R35	1000Ω	1		BTA-1000	
R36	6800Ω	½		BTS-6800	

♦ Items C10A, C10B, R15 are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA CORONADO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @.56A	506VCT .078ADC	5VAC @ 2A	6.3VAC @2.74A	53X353	P9205①②	P-3051 ①	PM8403 ①②		R-8B①②

① Drill new mounting holes.
② Tape 6.3V center tap.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA CORONADO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	6.3KΩ CT	7Ω	51X171A	Z1013	A-2905	A-3880	22S58①	S-57Z ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA CORONADO PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	5"	PM	15Ω	J-12A530-O	5A15T	
SP2	15"	PM	7Ω	J-12A529-A	15A10WF	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA CORONADO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Loop Ant.	1.2Ω		9A2376				
L2	RF Coil	10.2Ω		9A2289				Tap @6.2Ω
L3	Osc. Coil	.6Ω	6Ω	9A2113	14-1060	BC-387	71-OSC	
L4	Input IF	13Ω	15Ω	9A2112	16-6758	BC-352	12-C1	
L5	Output IF	14Ω	15Ω	9A2063	16-6758	BC-353	12-C2	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA CORONADO PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	REMARKS
M1		55-T	GD-J	47	0-1 or S-1 & 0-3	

ASTATIC AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

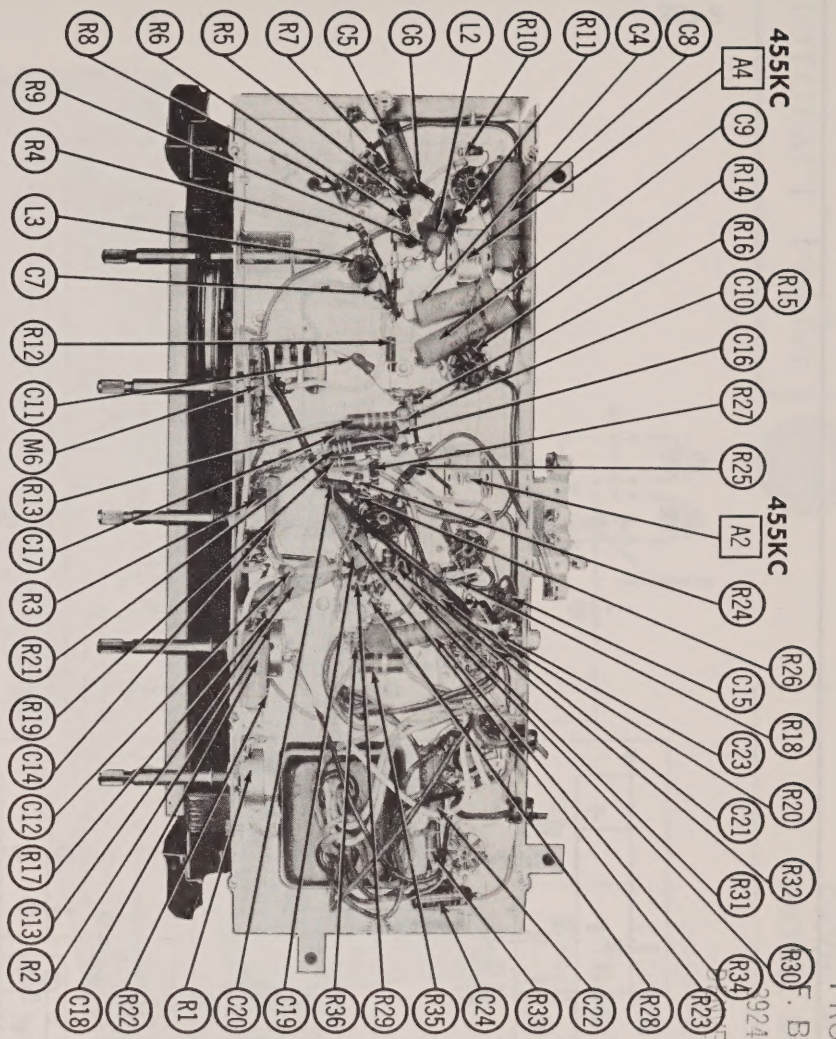
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA CORONADO PART No.	FIDELITONE PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2		†AC-130 or †♦AC-130D1 or ♦AC-130D	*S-67 or †S-66 or †♦S-66SD or ♦S-66D	†W-75TPS or †♦W-75DS or ♦W-75TPD	* Metal † Jewel ♦ Diamond

SET 337 FOLDER 2

CORONADO MODEL RA1-9243A

CHASSIS—BOTTOM VIEW



MISCELLANEOUS

ITEM No.	PART NAME	CORONADO PART No.	NOTES
M3	Dial Light		#47
M4	Dial Light		#47
M5	Tuning Cap.	14A226	3 Gang (17-495MMF, 13-245MMF, 13-105MMF)
M6	Switch	2A460	Radio-Phono (Rotary-wafer type)
	Knob	10A866-1	Tuning - Mahogany cabinets
	Knob	10A867-1	Radio-Phono switch, on-off-volume, tone - Mahogany cabinets
	Knob	10A866-2	Tuning - Oak cabinets
	Knob	10A867-2	Radio-Phono switch, on-off-volume, tone - Oak cabinets
	Dial Glass	58X789	Part No. 58X795 used in Models RA1-9243A, RA1-9244A
	Dial Pointer	15X278-2	

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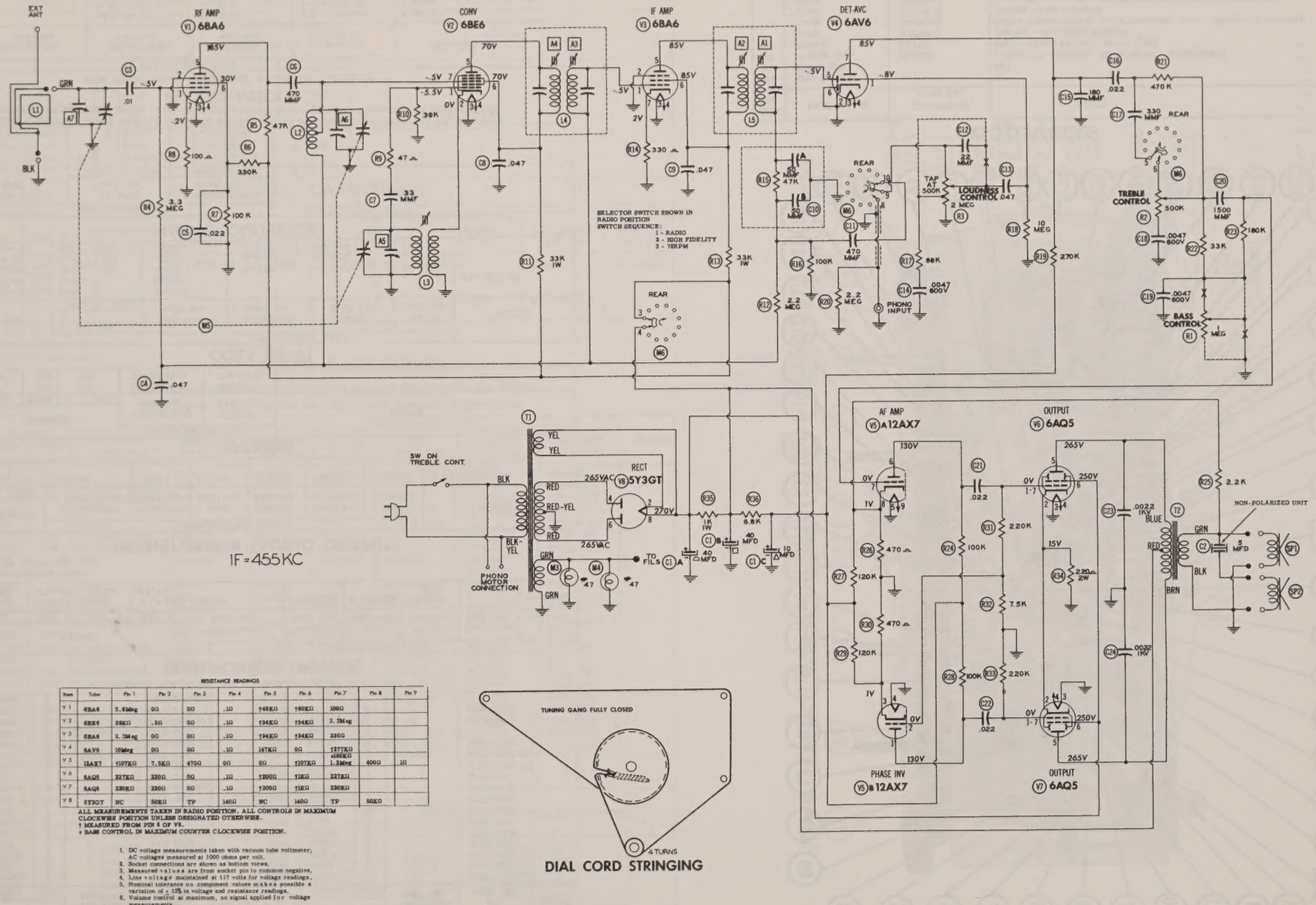
DENVER, COLORADO

CORONADO MODEL RA1-9243A



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BA6	5.6Meg	0Ω	0Ω	.1Ω	†48KΩ	†60KΩ	100Ω		
V 2	6BE6	39KΩ	.1Ω	0Ω	.1Ω	†34KΩ	†34KΩ	2.3Meg		
V 3	6BA6	2.3Meg	0Ω	0Ω	.1Ω	†34KΩ	†34KΩ	330Ω		
V 4	6AV6	10Meg	0Ω	0Ω	.1Ω	147KΩ	0Ω	†277KΩ		
V 5	12AX7	†107KΩ	7.5KΩ	470Ω	0Ω	0Ω	†107KΩ	‡180KΩ 1.3Meg	400Ω	1Ω
V 6	6AQ5	227KΩ	220Ω	0Ω	.1Ω	†200Ω	†1KΩ	227KΩ		
V 7	6AQ5	230KΩ	230Ω	0Ω	.1Ω	†200Ω	†1KΩ	230KΩ		
V 8	5Y3GT	NC	50KΩ	TP	140Ω	NC	140Ω	TP	50KΩ	

ALL MEASUREMENTS TAKEN IN RADIO POSITION. ALL CONTROLS IN MAXIMUM CLOCKWISE POSITION UNLESS DESIGNATED OTHERWISE.
† MEASURED FROM PIN 8 OF V8.
‡ BASS CONTROL IN MAXIMUM COUNTER CLOCKWISE POSITION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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DAVID BOGEN MODEL DO110

PROPERTY OF
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3924 MEADE ST.
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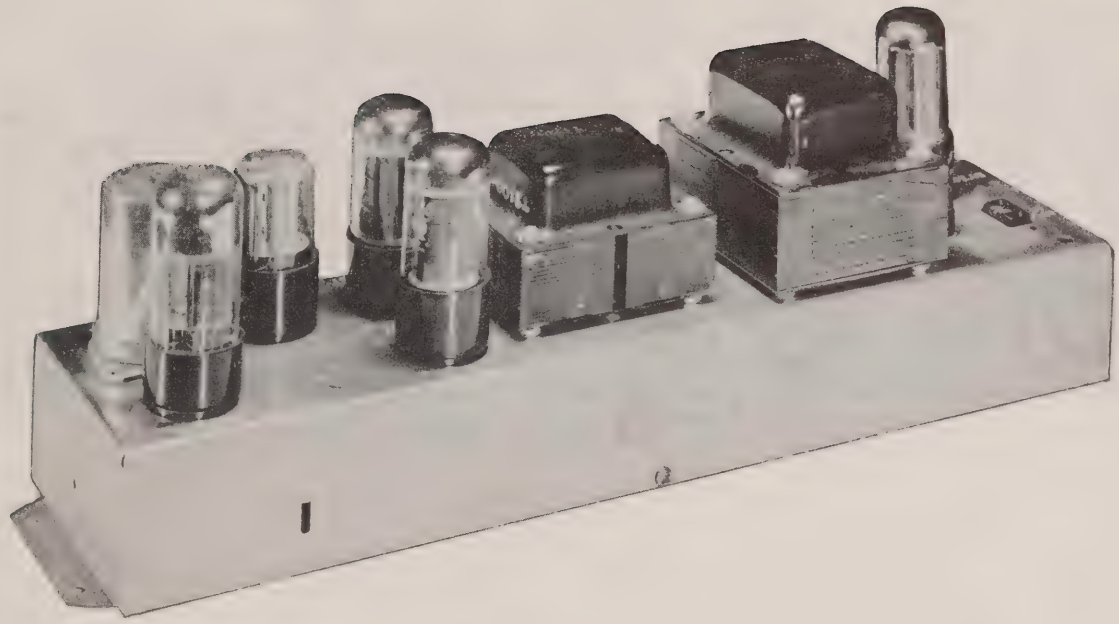
DAVID BOGEN
MODEL DO110



DAVID BOGEN
MODEL DO110

TRADE NAME	David Bogen Model DO110
MANUFACTURER	David Bogen Co., Inc., 29 Ninth Ave., New York 14, N. Y.
TYPE SET	AC Operated 12 Watt Audio Amplifier
TUBES (Five)	Types 6SN7GT AF Amplifier-Voltage Regulator, 6SL7GT AF Amplifier-Phase Inverter, (2) 6V6GT Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles RATING .56 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

DAVID BOGEN
MODEL DO110

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amp. -Volt Reg.	6SN7GT	
V2	AF Amp. -Phase Inv.	6SL7GT	
V3	Output	6V6GT	
V4	Output	6V6GT	
V5	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	David Bogen PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲10	450		AFH4-10	D009	FP434	TMQ-10	Q-030	TVL-4760
B	■10	450							
C	●10	450							
D	10	450							
C2	50	50		PRS50V50	BR505	TC39	TD-50-50	FM-0550	TVA-1308

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	David Bogen PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	.22	400		P488N-22		CUB4P22		PT4022	4TM-P22	
C4	4700			BPD-0047	DD-472	K079	811-0047	UC-5247	5HK-D47	
C5	680			BPD-00068	DD-681	K065	811-681	UC-5368	5GA-T68	
C6	100			BPD-0001	DD-101	G042	801-101	UC-531	5GA-T1	
C7	.1	400		P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C8	.1	400		P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C9	15			SI15	D6-150	G021	831-150	UC-5415	5GA-Q15	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	David Bogen PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	V275A	AB-60	A47-500K-Z	Q13-133	U48	Volume
B	Shaft		Not Req.	AK-1	FKS-1/4	Not Req.	Not Req.	Attach to R1A

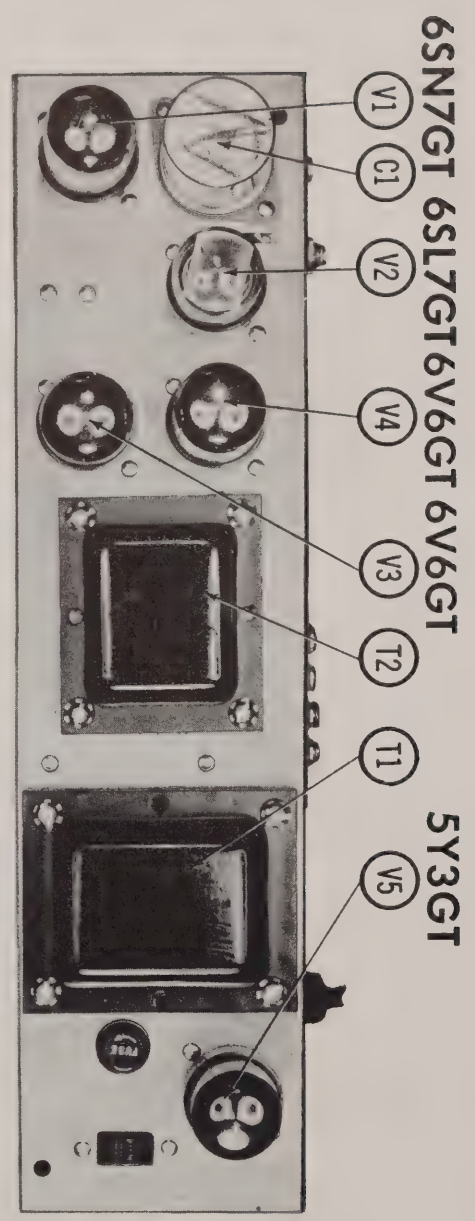
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	David Bogen PART No.	IRC PART No.	
R2	100K 5%			BTS-100K 5%	
R3	47K			BTS-47K	
R4	1500Ω 5%			BTS-1500 5%	
R5	47K			BTS-47K	
R6	1.2Meg			BTS-1.2Meg	
R7	3.3Meg			BTS-3.3Meg	
R8	470K			BTS-470K	
R9	470K			BTS-470K	
R10	12K			BTS-12K	
R11	2700Ω 5%			BTS-2700 5%	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	David Bogen PART No.	IRC PART No.	
R12	68K			BTS-68K	
R13	100K 5%			BTS-100K 5%	
R14	100K 5%			BTS-100K 5%	
R15	10K			BTS-10K	
R16	200K 5%			BTS-200K 5%	
R17	200K 5%			BTS-200K 5%	
R18	300Ω	7		PW7-300	
R19	20K 5%			BTS-20K 5%	
R20	51K 5%			BTS-51K 5%	
R21	1Meg			BTS-1Meg	
R22	8000Ω	7		PW7-8200	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	David Bogen PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC ⓐ .56A	700VCT ⓐ .079A	5VAC ⓐ 2A	6.3VCT ⓐ 1.8A	T362-3	P9311	P-2952	PM-8409	24R04	R-11B

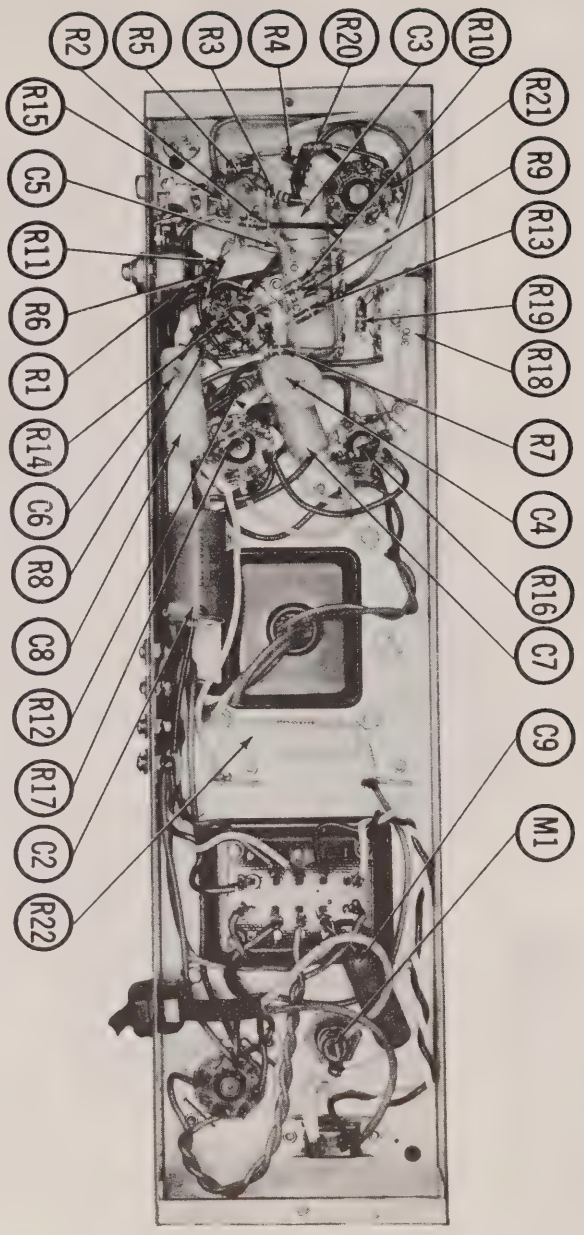
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	David Bogen PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	11K	16Ω tap ⓐ 8Ω tap ⓐ 4Ω	T2106-1				22S93 ①		① Fabricate Mounting

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			David Bogen PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG S/B	2A 125V			313002, (3AG-S/B-2A)	342001	MDL2	HKP

CHASSIS—BOTTOM VIEW

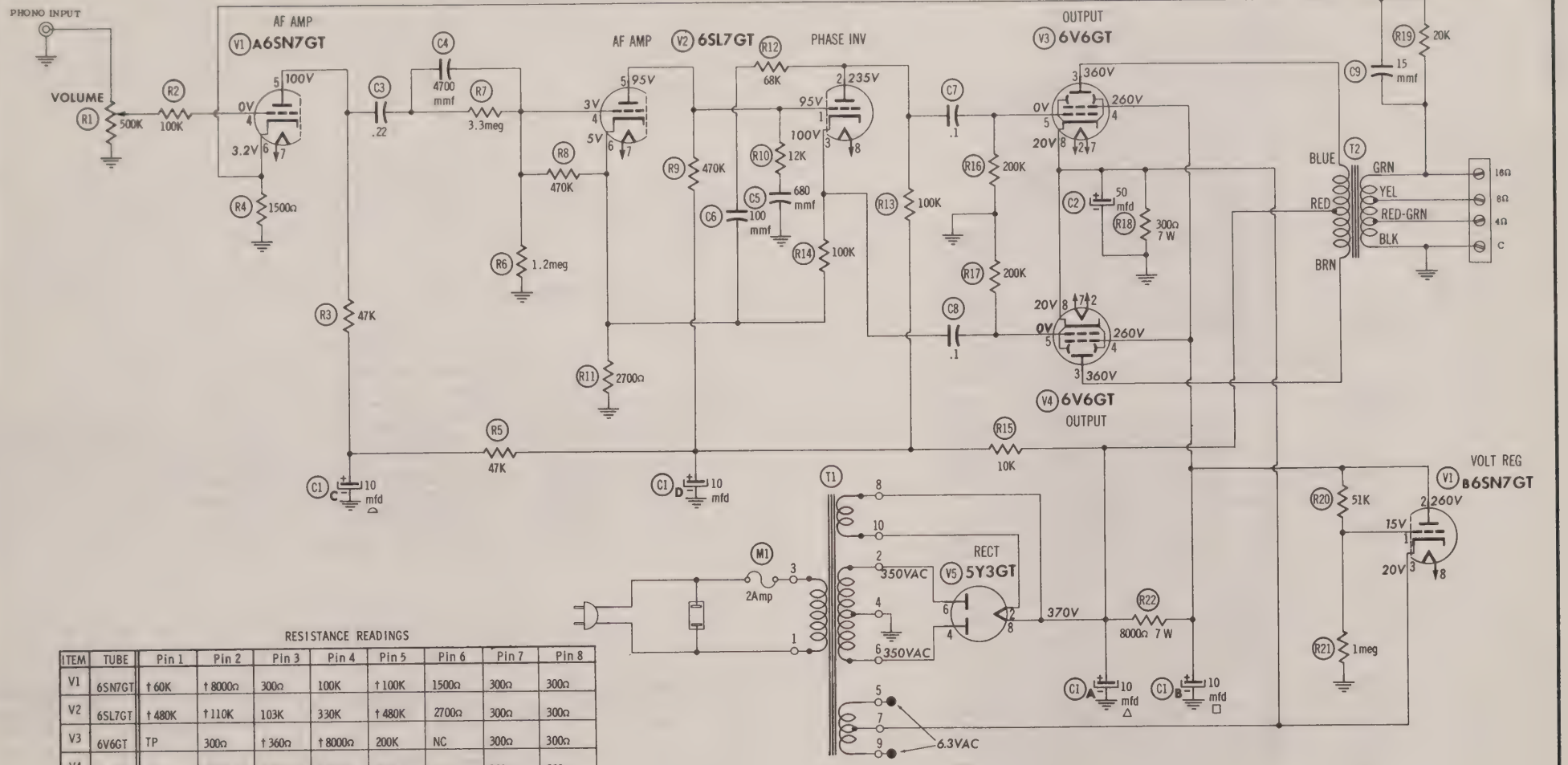


PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

DAVID BOGEN
MODEL DOLLO

SET 337 FOLDER 3

DAVID BOGEN
MODEL DOLLO



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V1	6SN7GT	†60K	†8000Ω	300Ω	100K	†100K	1500Ω	300Ω	300Ω
V2	6SL7GT	†480K	†110K	103K	330K	†480K	2700Ω	300Ω	300Ω
V3	6V6GT	TP	300Ω	†360Ω	†8000Ω	200K	NC	300Ω	300Ω
V4	6V6GT	TP	300Ω	†350Ω	†8000Ω	200K	TP	300Ω	300Ω
V5	5Y3GT	NC	25K	NC	170Ω	NC	160Ω	NC	25K

† MEASURED FROM PIN 8 OF V5.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

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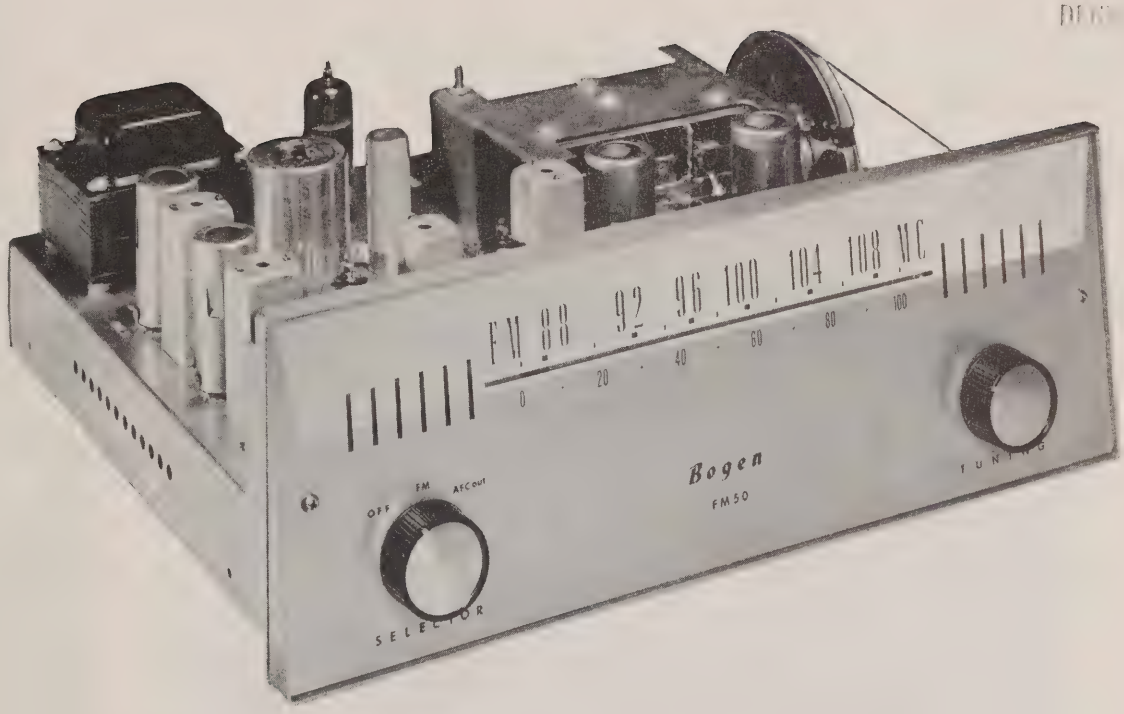
DAVID BOGEN
MODEL FM50

PROPERTY OF
L. F. BLANKENSHIP
2024 MEADE ST.
DENVER 11, COLORADO

DAVID BOGEN
MODEL FM50



DAVID BOGEN
MODEL FM50

TRADE NAME	David Bogen Model FM50
MANUFACTURER	David Bogen Co., Inc., 29 Ninth Ave., New York 14, N. Y.
TYPE SET	AC Operated FM Superheterodyne Tuner
TUBES (Seven)	Types 12AT7 RF Amplifier-Mixer, 6U8 Oscillator-AFC, 6AU6 1st IF Amplifier, 6AU6 2nd IF Amplifier, 6AU6 Limiter, 6AL5 Discriminator, 6X4 Rectifier
POWER SUPPLY	105-125 Volts AC - 60 Cycles RATING .27 Amp. @ 117 Volts AC
TUNING RANGE--FM	88MC - 108MC

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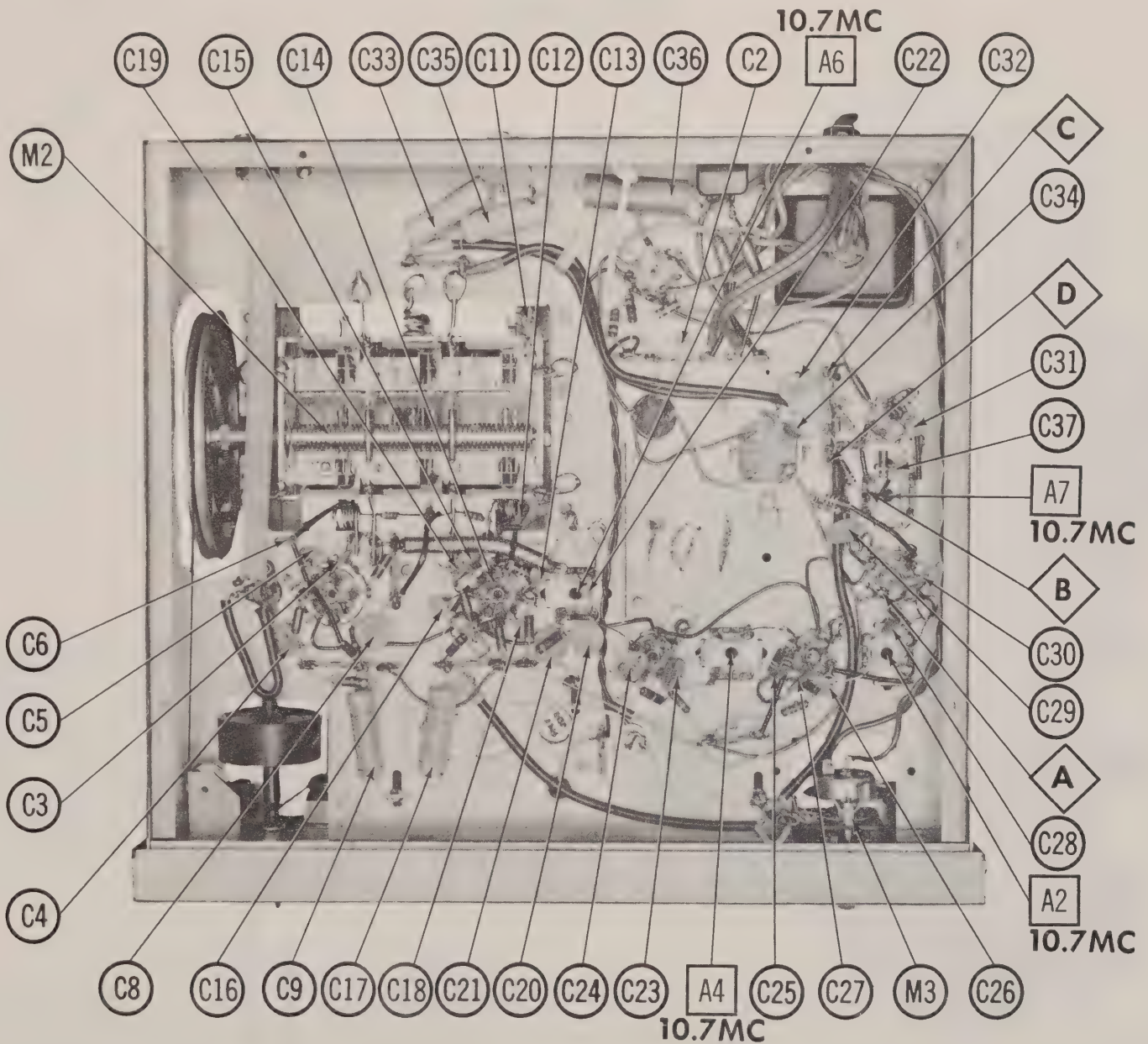
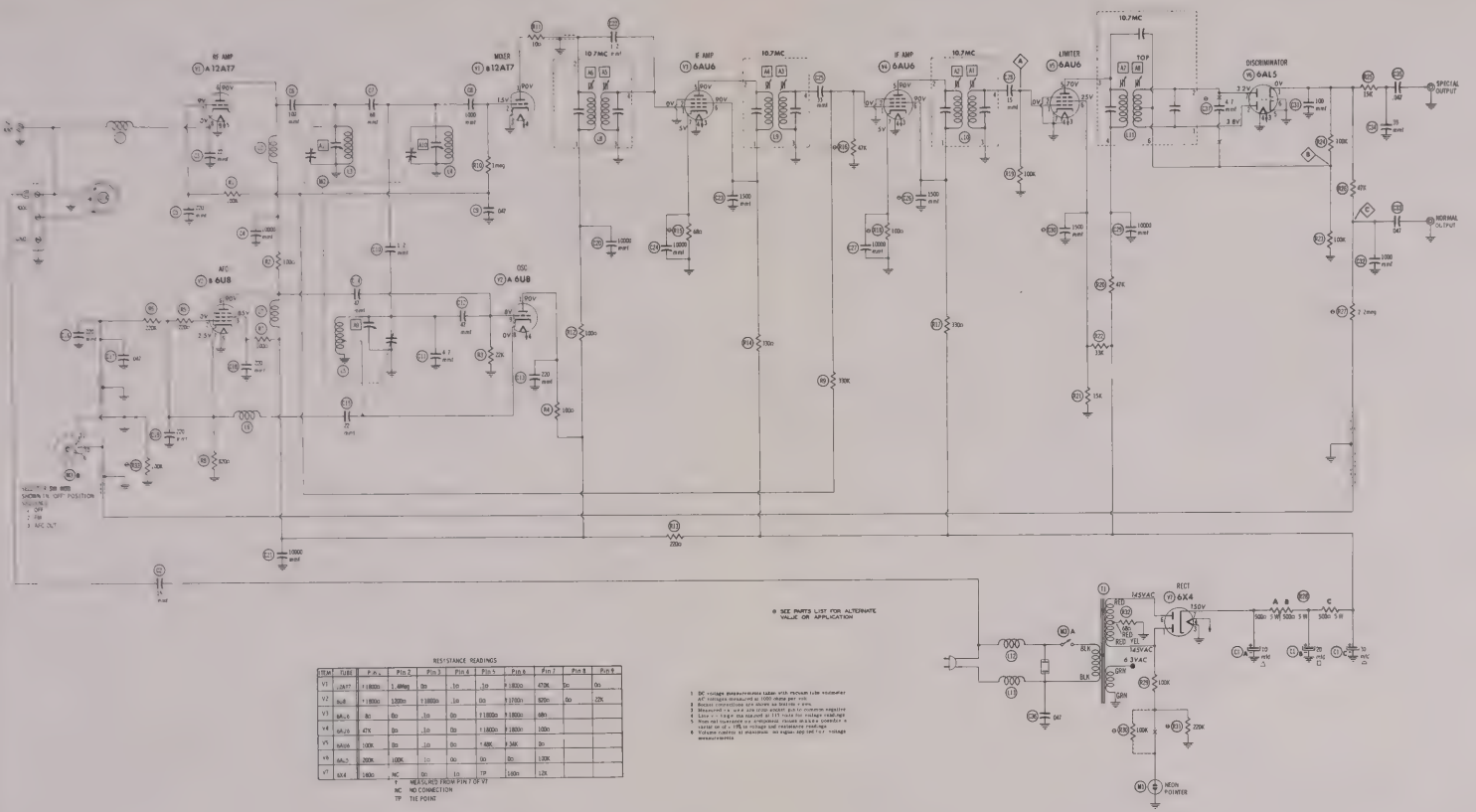


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



RESISTANCE READINGS

ITEM	TUBE	P.H.	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AT7	1800Ω	1.4Meg	0Ω	1Ω	1Ω	1820Ω	470K	0Ω	0Ω
V2	6U8	1800Ω	1320Ω	1800Ω	1Ω	0Ω	1700Ω	820Ω	0Ω	22K
V3	6AU6	8Ω	0Ω	1Ω	0Ω	1800Ω	1800Ω	68Ω		
V4	6AU6	47K	0Ω	1Ω	0Ω	1800Ω	1800Ω	100Ω		
V5	6AL5	100K	0Ω	1Ω	0Ω	48K	36K	0Ω		
V6	6AL5	200K	100K	1Ω	0Ω	0Ω	0Ω	100K		
V7	6X4	1400	NC	0Ω	1Ω	TP	160Ω	12K		

T - MEASURED FROM PIN 7 OF V7
NC - NO CONNECTION
TP - TEST POINT

1 DC voltage measurements taken with vacuum tube voltmeter at voltages measured at 1000 ohms per volt.
2 Before measurements are taken, set receiver controls as shown in owner's manual.
3 Measured in each case from ground point to indicated voltage.
4 Line voltage maintained at 117 volts for voltage readings.
5 Normal variations in component values may cause voltages to vary as much as ± 10% in voltage and resistance readings.
6 Voltages measured at minimum signal input for voltage measurements.

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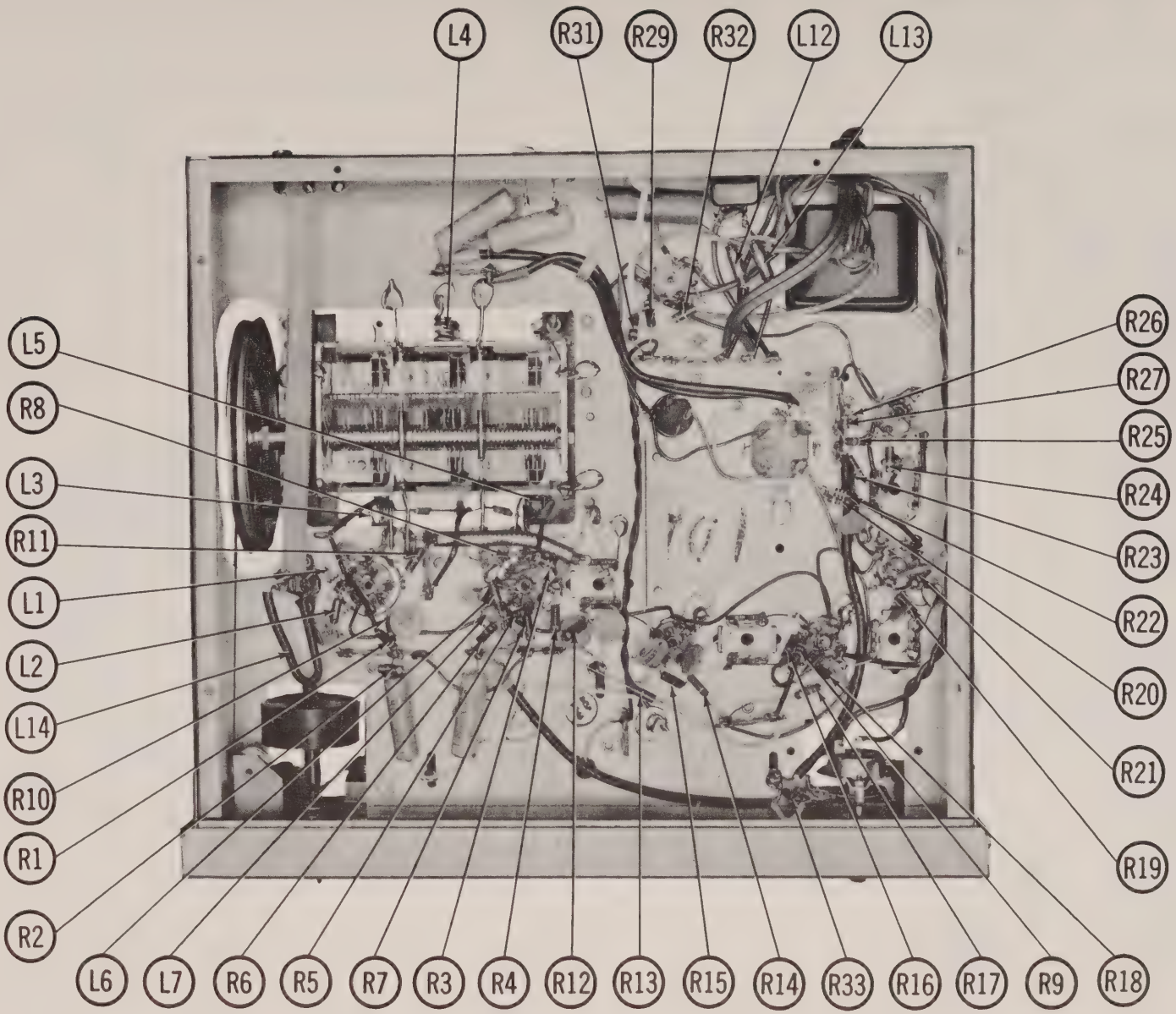

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

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3324 MEADE ST.
DENVER, COLORADO

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to pin 2 (grid) of 12AT7 (V1). Low side to chassis.	10.7MC (unmod)	FM	Point of non-interference.	DC probe thru 100K to point (A). Common to chassis.	A1, A2, A3, A4, A5, A6	Adjust for maximum deflection.
2.	"	"	"	"	"	DC probe thru 100K to point (B). Common to chassis.	A7	"
3.	"	"	"	"	"	DC probe thru 100K to point (C). Common to chassis.	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
1.	.01MFD	High side to pin 2 (grid) of 12AT7 (V1). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference.	Vert. amp. thru 100K to point (A). Low side to chassis.	A1, A2, A3, A4, A5, A6	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
2.	"	"	"	"	"	Vert. amp. thru 100K to point (B). Low side to chassis.	A7	"
3.	"	"	"	"	"	Vert. amp. thru 100K to point (C). Low side to chassis.	A8	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	Fig. 3	Antenna connection as shown in Fig. 3.	106MC	FM	106MC	DC probe thru 100K to point (A). Common to chassis.	A9, A10, A11	Short AFC to ground at junction of C16 and C17. Adjust for maximum deflection.

FIG. 1

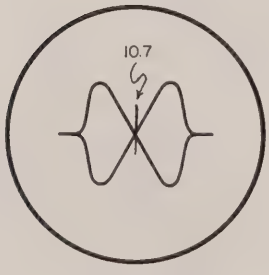

FIG. 2

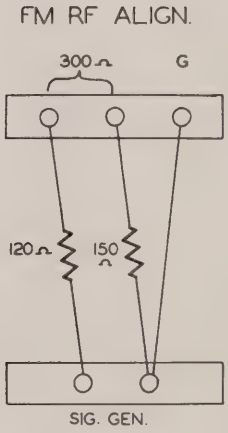

FIG. 3

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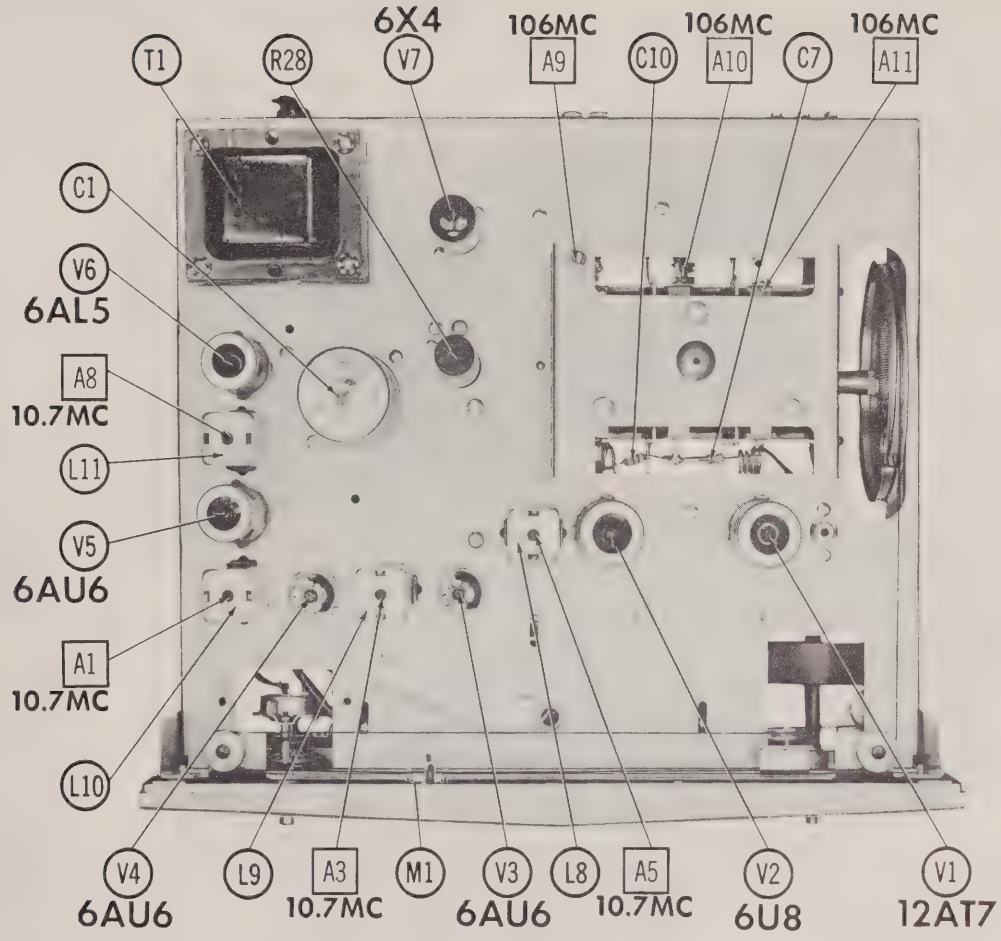
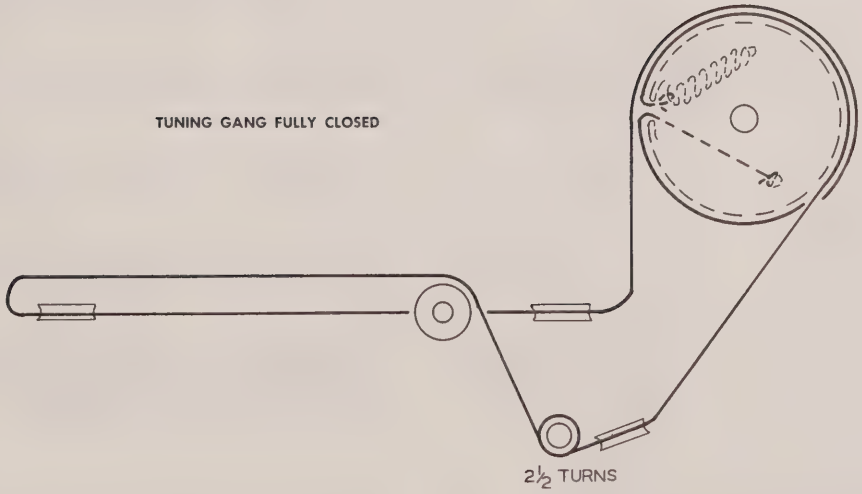


CHASSIS TOP VIEW



DIAL CORD STRINGING

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amp.-Mixer	12AT7	
V2	Oscillator-AFC	6U8	
V3	1st IF Amplifier	6AU6	
V4	2nd IF Amplifier	6AU6	
V5	Limiter	6AU6	
V6	Discriminator	6AL5	
V7	Rectifier	6X4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	David Bogen PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲10	350		AFH3-153-30	D042	FP343.6	TMQ-11	Q-035	R2250*
B	■20	350					TD-12-350	FM-3512	
C	▲30	350							

* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	David Bogen PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	15				TCA-15		N330K-150			
C3	22			NP0-DI22	TCZ-22	Z024	NP0K-220		5TCC-Q22	
C4	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C5	220			DI-00022	D6-221	TZ30	811-221	UC-5322	5GA-T22	
C6	100			DI-0001	DD-101	TZ38	801-101	MCB235	5TCC-T1	
C7	.68				TCZ-R68	TZ02	NP0A-0R68			
C8	1000			DI-001	DD-102	K069	811-102	DC521	5GA-D1	
C9	.047	200		BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C10	1.2									
C11	4.7						N330A-4R7			
C12	47			N750-DI47	TCN-47	N033	N750K-470	NT-5447	5TCU-Q47	
C13	220			DI-00022	D6-221	TZ38	811-221		5TCC-T22	
C14	47			N750-DI47	TCN-47	N033	N750K-470	NT-5447	5TCU-Q47	
C15	22			N750-DI22	TCN-22	N024	N750K-220	NT-5422	5TCU-Q22	
C16	220			DI-00022	D6-221	G051	811-221	UC-5322	5GA-T22	
C17	.047	200		BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C18	220			DI-00022	D6-221	G051	811-221	UC-5322	5GA-T22	
C19	220			DI-00022	D6-221	G051	811-221	UC-5322	5GA-T22	
C20	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C21	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C22	1.2									
C23	1500			BPD-0015	DD-152	K071	801-0015	DC5215	5HK-D15	
C24	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C25	33			NP0-DI33	TCZ-33	Z029	NP0L-330	ZT-5433	5TCC-Q33	
C26	1500			BPD-0015	DD-152	K071	801-0015	DC5215	5HK-D15	Note 1
C27	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C28	15				TCA-15		N330K-150			
C29	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C30	1500			BPD-0015	DD-152	K071	801-0015	DC5215	5HK-D15	Note 1
C31	100			DI-0001	DD-101	G042	801-101	ZT-531	5TCC-T1	
C32	1000			DI-001	DD-102	K069	801-102	DC521	5GA-D1	
C33	.047	200		BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C34	33			NP0-DI33	TCZ-33	Z029	NP0L-330	ZT-5433	5TCC-Q33	
C35	.047	200		BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C36	.047	600		BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	
C37	4.7						N330A-4R7			Note 2

Note 1: Some versions may use .01MFD in this application.
Note 2: Not used in some versions.

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA David Bogen PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R1	100K			BTS-100K	
R2	100Ω			BTS-100	
R3	22K			BTS-22K	
R4	100Ω			BTS-100	
R5	220Ω			BTS-220	
R6	220K			BTS-220K	
R7	100Ω			BTS-100	
R8	820Ω			BTS-820	
R9	330K			BTS-330K	
R10	1Meg			BTS-1Meg	
R11	10Ω			BTS-10	
R12	100Ω			BTS-100	
R13	220Ω			BTS-220	
R14	330Ω			BTS-330	
R15	68Ω			BTS-68	
R16	47K			BTS-47K	Note 1
R17	330Ω			BTS-330	
R18	100Ω			BTS-100	Note 2
R19	100K			BTS-100K	
R20	47K			BTS-47K	
R21	15K			BTS-15K	
R22	33K			BTS-33K	
R23	100K			BTS-100K	
R24	100K			BTS-100K	
R25	15K			BTS-15K	
R26	47K			BTS-47K	
R27	2.2Meg			BTS-2.2Meg	Note 3
R28A	500Ω	5		PW7-500	
B	500Ω	5		PW7-500	
C	500Ω	5		PW7-500	
R29	100K			BTS-100K	
R30	100K			BTS-100K	Note 4
R31	220K			BTS-220K	Note 1
R32	68Ω			BTS-68	
R33	100K			BTS-100K	Note 4

Note 1: Some versions use 100K in this application.
Note 2: Some versions use 68Ω in this application.
Note 3: Some versions use 1Meg in this application.
Note 4: Not used in some versions.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA David Bogen PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @.27A	300VCT @.034A	6.3VAC @2.75A		T375-1A				22R38 ①	

① Tape 6.3VCT.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA David Bogen PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Loading Coil	0Ω		U346				
L2	RF Choke	0Ω		U420				1.7 Microhenries
L3	Ant. Coil	0Ω		U441				
L4	RF Coil	0Ω		U434				
L5	Osc. Coil	0Ω		U443				Tapped
L6	RF Choke	0Ω		U432	19-1000		4602	1.1 Microhenries
L7	RF Choke	3Ω		U507				3.3 Microhenries; IRC part #CLA
L8	1st IF Trans.	.8Ω	.8Ω	H-355	16-3487	FM-254	1463	
L9	2nd IF Trans.	.8Ω	.8Ω	H-355	16-3487	FM-254	1463	
L10	Limiter	.8Ω	.8Ω	H-355	16-3487	FM-254	1463	
L11	Discriminator	.8Ω	.8ΩCT	H-295	17-3494	FM-253	1464	
L12	Line Choke	.1Ω		U512				1.9 Microhenries
L13	Line Choke	.1Ω		U512				1.9 Microhenries
L14	Ant. Matching Coil	0Ω		H456				

MISCELLANEOUS

ITEM No.	PART NAME	David Bogen PART No.	NOTES
M1	Neon Bulb		Dial Pointer
M2	Tuning Cap.	C639A	3 Gang
M3A	Switch	S463A	On-Off (Power) SPST
B	Switch		Selector (SP-3 Position; Rotary, Wafer Type)

ELECTRO-VOICE MODEL A100

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

ELECTRO-VOICE
MODEL A100

ELECTRO-VOICE
MODEL A100

TRADE NAME	Electro-Voice Model A100
MANUFACTURER	Electro-Voice, Inc., Buchanan, Michigan
TYPE SET	AC Operated 100 Watt Audio Amplifier
TUBES (Eight)	Types 12AX7 AF Amplifier-Phase Inverter, 12BH7A Driver, (4) 6550 Output, (2) 5U4GB Rectifier
POWER SUPPLY	105-125 Volts AC - 60 Cycles RATING 2.24 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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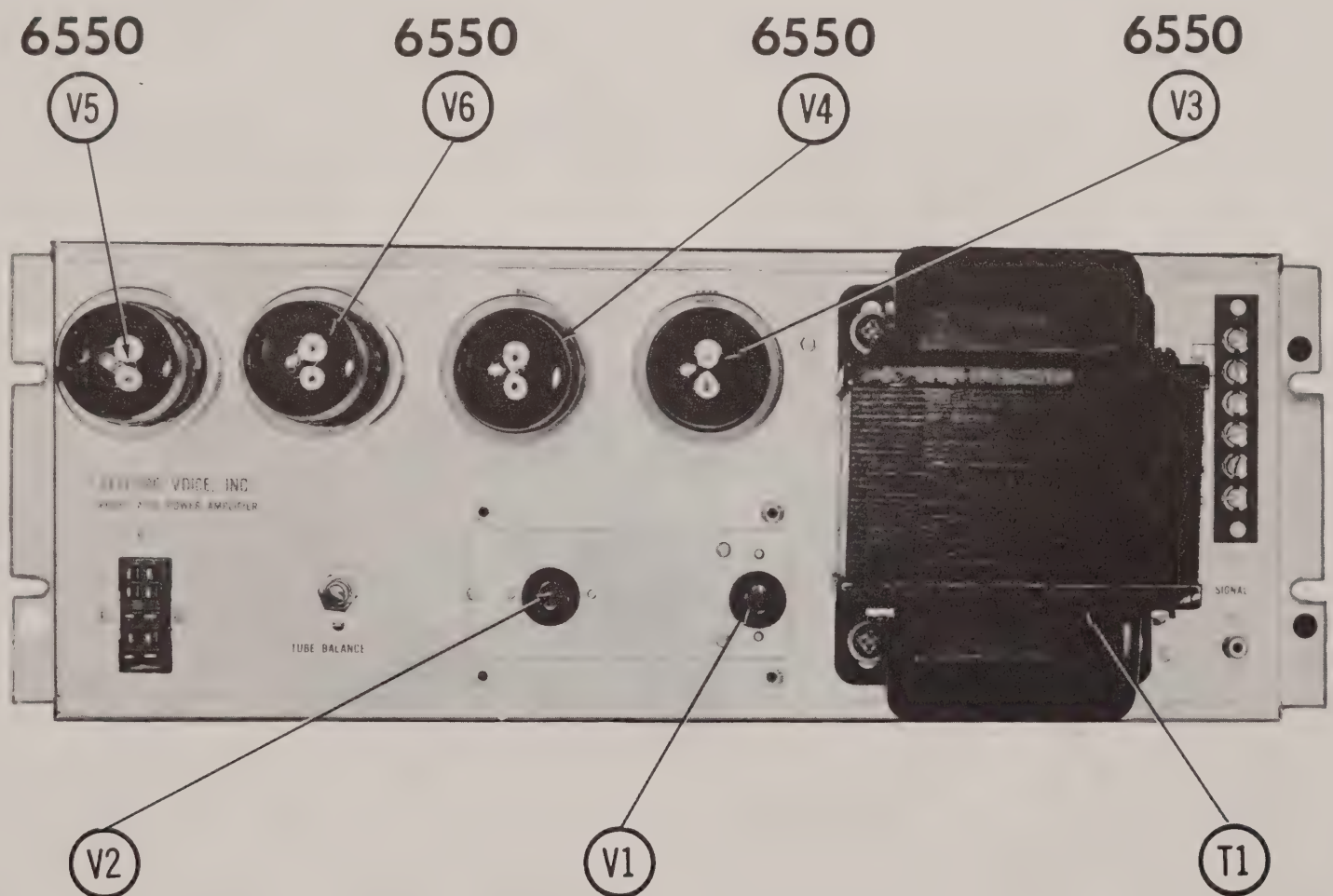
AMP. CHASSIS - TOP VIEW



PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amp. -Phase Inv.	12AX7	
V2	Driver	12BH7A	
V3	Output	6550	
V4	Output	6550	
V5	Output	6550	
V6	Output	6550	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Electro-Voice PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1	.1	200	4265	P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C2	100		4281	BPD-0001	DD-101	G042	831-101	UC-531	5GA-T1	
C3	.022	400	4260	BPD-02	DD-203	CUB4S22	817-02	PT4122	4TM-S22	
C4	.047	400	4243	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C5	.047	400	4243	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C6	10000		4257	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C7	.1	600	4241	P688N-1	DF-104	CUB6P1		PT601	6TM-P1	
C8	.1	600	4241	P688N-1	DF-104	CUB6P1		PT601	6TM-P1	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Electro-Voice PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	250K	½	L4686	B-51	A47-250K-Z	Q13-130	U44	Gain
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
R2A	.5Ω	4	M4686					Damping Factor (Wire-wound)
B	1800Ω	4						
R3A	10K	½	S4686	AB-14	A47-10K-S	Q11-116	U20	Tube Balance
B	Shaft		Not Req.	AK-1	FKS-1/4	Not Req.	Not Req.	Attach to R3A

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

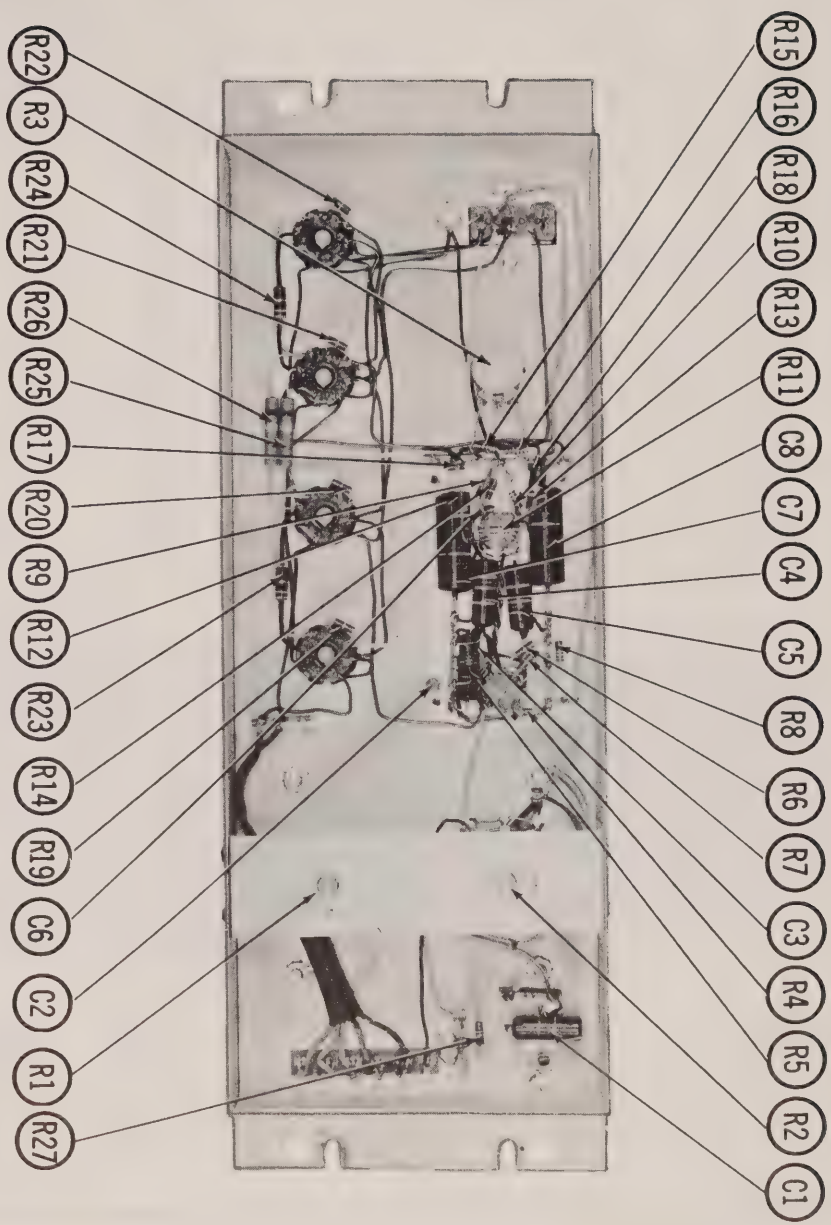
ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Electro-Voice PART No.	IRC PART No.	NOTES
R4	270K		4669	BTS-270K	
R5	27K		4651	BTS-27K	
R6	1.2Meg		4656	BTS-1.2Meg	
R7	470Ω		4654	BTS-470	
R8	27K		4651	BTS-27K	
R9	470K		4650	BTS-470K	
R10	470K		4650	BTS-470K	
R11	330K			BTS-330K	Note 1
R12	12K	2	4679	BTB-12K	
R13	12K	2	4679	BTB-12K	
R14	1200Ω		4658	BTS-1200	
R15	82K		4696	BTS-82K	
R16	82K		4696	BTS-82K	
R17	470K		4650	BTS-470K	
R18	470K		4650	BTS-470K	
R19	120Ω		4607	BTS-120	
R20	120Ω		4607	BTS-120	
R21	120Ω		4607	BTS-120	
R22	120Ω		4607	BTS-120	
R23	33Ω	1	46047	BTA-33	
R24	33Ω	1	46047	BTA-33	
R25	1000Ω	2	46018	BTB-1000	
R26	1000Ω	2	46018	BTB-1000	
R27	68K		46019	BTS-68K	

Note 1: Not used in some versions.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Electro-Voice PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	600Ω	16Ω tap ③ 8Ω tap ④ 4Ω	1584 ①						① Primary has taps for 70V winding.

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V7	Rectifier	5U4GB	

ITEM No.	USE	TYPE	NOTES
V8	Rectifier	5U4GB	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Electro-Voice PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C9A	▲40	500	4247	AFH2-72	B053	FP288	TMD-62	D-275	R1495*
B	▲40	500							
C10A	▲40	500	4247	AFH2-72	B053	FP288	TMD-62	D-275	R1495*
B	▲40	500							
C11	20	450	4246	AFH1-50	A046	FP144	TMS-55	S-260	TVL-1714
C12	50	100	4242	PRS150V50	BR5015	TC49	TD-50-150	FM-1550	TVA-1414

* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Electro-Voice PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C13	.047	400	4243	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C14	.047	400	4243	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Electro-Voice PART No.	IRC PART No.	
R28	56K		4652	BTS-56K	
R29	56K		4652	BTS-56K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Electro-Voice PART No.	IRC PART No.	
R30	220Ω		4664	BTS-220	

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	Electro-Voice PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	117VAC @ 2.24A	1100VCT @ .126A	1100VCT @ .144A	5VAC @ 3A	1585					
		SEC. 4	SEC. 5	SEC. 6						
		5VAC @ 3A	6.3VAC @ 7A	45V*						

* Bias supply.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	Electro-Voice PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L1	.126A	82Ω	5.3HY	1586	C5031		C-1410 ①	20C55	
L2	.144A	82Ω	5.3HY	1586	C5031		C-1410 ①	20C55	

① Drill new mounting holes.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Electro-Voice PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	3/4A 250V	20221		312.750 (3AG-3/4A)	342001	AGC 3/4	HKP
M2	3AG	3/4A 250V	20221		312.750 (3AG-3/4A)	342001	AGC 3/4	HKP
M3	3AG S/B	4A 125V	20218		313004. (3AG-S/B-4A)	342001	MDX4	HKP

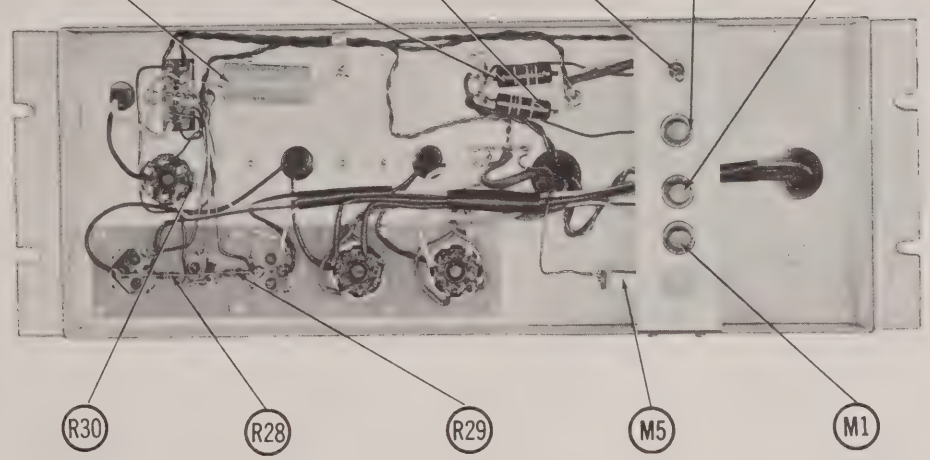
SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	Electro-Voice PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M4		8694	1159	CR-10	8S20		10	

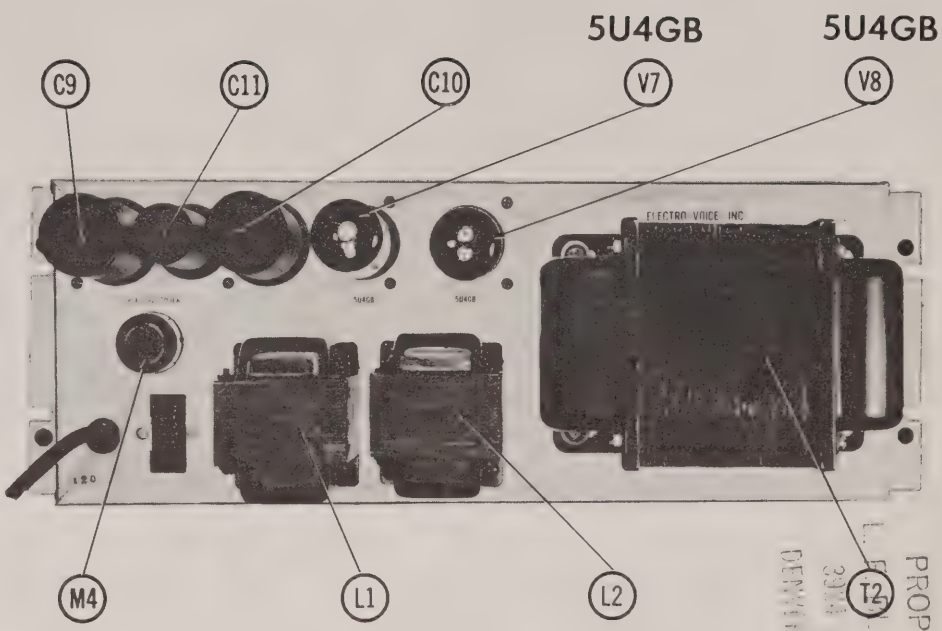
MISCELLANEOUS

ITEM No.	PART NAME	Electro-Voice PART No.	NOTES
M5	Pilot Light		#1847
M6	Switch		On-Off (Power) DPST

POWER CHASSIS - BOTTOM VIEW



POWER CHASSIS - TOP VIEW



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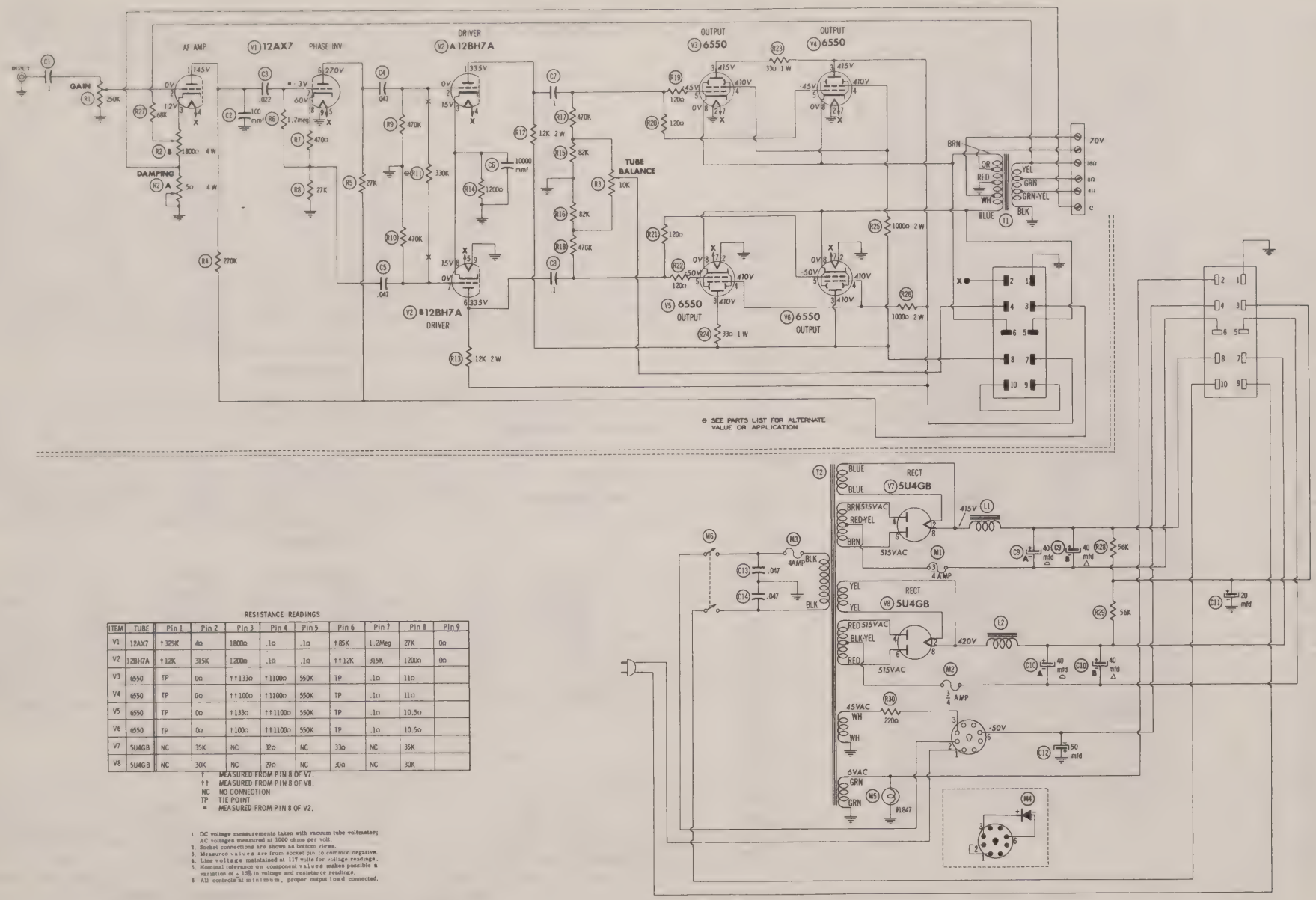

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†325K	4Ω	1800Ω	.1Ω	.1Ω	†85K	1.2Meg	27K	0Ω
V2	12BH7A	†12K	315K	1200Ω	.1Ω	.1Ω	††12K	315K	1200Ω	0Ω
V3	6550	TP	0Ω	††133Ω	†1100Ω	550K	TP	.1Ω	11Ω	
V4	6550	TP	0Ω	††100Ω	†1100Ω	550K	TP	.1Ω	11Ω	
V5	6550	TP	0Ω	†133Ω	††1100Ω	550K	TP	.1Ω	10.5Ω	
V6	6550	TP	0Ω	†100Ω	††1100Ω	550K	TP	.1Ω	10.5Ω	
V7	5U4GB	NC	35K	NC	32Ω	NC	33Ω	NC	35K	
V8	5U4GB	NC	30K	NC	29Ω	NC	30Ω	NC	30K	

† MEASURED FROM PIN 8 OF V7.
†† MEASURED FROM PIN 8 OF V8.
NC NO CONNECTION
TP TIE POINT
* MEASURED FROM PIN 8 OF V2.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

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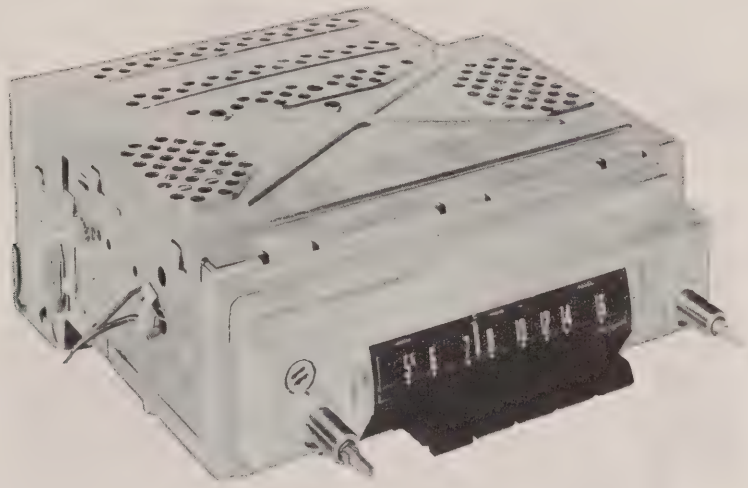
RETMA MEMBER

FORD MODEL 66MFP (FDR-18805-B1)

PROPERTY OF
3924 MEADE ST.
DENVER, COLORADO

FORD MODEL 66MFP (FDR-18805-B1)



TRADE NAME	Ford Model 66MFP (FDR-18805-B1) (For 1956 Ford Automobiles)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Ill.
TYPE SET	Battery Operated Custom Built AM Superheterodyne Automobile Receiver
TUBES (Six)	Types 12BA6 RF Amplifier, 12BE6 Converter, 12AU6 IF Amplifier, 12AV6 Det-AVC-AF Amp., 12AB5 Output, 12X4 Rectifier
POWER SUPPLY	12 Volt Storage Battery — RATING 2.6 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	540KC - 1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V2). Low side to chassis.	262.5KC (400∿ Mod)	High frequency end stop.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Fig. 1	Thru dummy to antenna receptacle. Low side to chassis.	1605KC	"	"	A5, A6, A7	"
*3.	"	"	"	"	"	"	Using alignment tool (Fig. 2), back A8, A9 and A10 (tuning cores) out of coils but not out of coil forms. Adjust A5, A6 and A7 for maximum output.
*4.	"	"	1180KC	Adjust 19/64" from high frequency end stop.	"	A8, A9, A10	Using alignment tool (Fig. 2), adjust A8, A9 and A10 for maximum output.
*5.	"	"	1605KC	High frequency end stop.	"	A5, A6, A7	Retouch for maximum output.
6.	With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum volume.						

PUSHBUTTON ADJUSTMENT

Pull pushbutton out. Manually tune to desired station. Press pushbutton in firmly. Repeat on remaining pushbuttons.

* Not necessary, except in case of tampering or replacement of tuning cores or components.

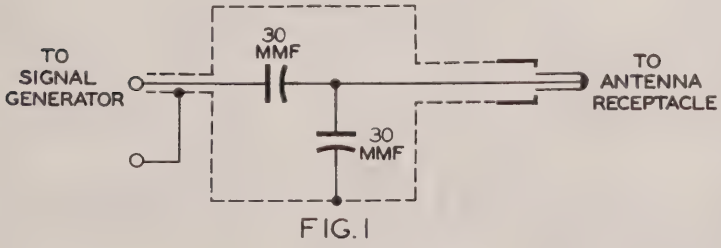


FIG. 1

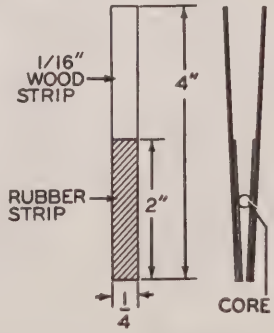


FIG. 2

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PARTS LIST AND DESCRIPTIONS

FORD
MODEL 66MFD (FDR-18805-B1)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BA6	
V2	Converter	12BE6	
V3	IF Amplifier	12AU6	
V4	Det-AVC-AF Amp.	12AV6	
V5	Output	12AB5	
V6	Rectifier	12X4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲10	350	23A485677	AFH3-104	C077	FP328	TMT-89	T-455	R2274*
B	■15	350							
C	20	25							

* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	120		21K533470							
C3	100		21K538726	NP0-D1100	TCZ-100	TZ30	NP0-337-101	ZT-531	5TCC-T1	
C4	.05	200	8B120842	BPD-05	DF-503			PT8415	2SE-S47	
C5	8.2		21R120159	NP0-D18.2		Z016	NP0A-8R2			
C6	47		21K537509	N750-D147	TCN-47	N033	N750K-470	NT-5447	5TCU-Q47	
C7	.05	400	8K121268	BPD-05	DF-503			PT8415	4SE-S47	
C8	4.7		21R115955	NP0-S14.7	TCZ-4R7	Z010	NP0A-4R7	ZT-5547	5TCCB-V47	
C9A	10000		†51B337111	†PA472						
B	10000									
C	3000									
D	15000									
E	330									
C10	.003	600	8R121569	DI-003	D6-302	CUB6D3	GP2-333-302	PT623	6TM-D3	
C11	.04	1000	8A121549	P1088N-04		CUB16S4		PT1614	10TM-S4	
C12	.5	100	8K122076	VHC36		ST2P5		RF480	68P20	
C13	.5	100	8K122076	VHC36		ST2P5		RF480	68P20	

† Items C9A, C9B, C9C, C9D, C9E, R13A and R13B are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2Meg	½	18B534483			•QJ-891A		Tone (Panel)
B	500K	½						Volume-Tap ⓐ 150K (Rear)
C	Switch							
R2	3000Ω	1	18A537912					Sensitivity (Wire-wound)

•Concentrikit equivalent: Kit K-6, Base Elements & Shafts; B11-139, P14-214 (Panel)
B13-133X, R1-228 (Rear)
76-2 (Switch)

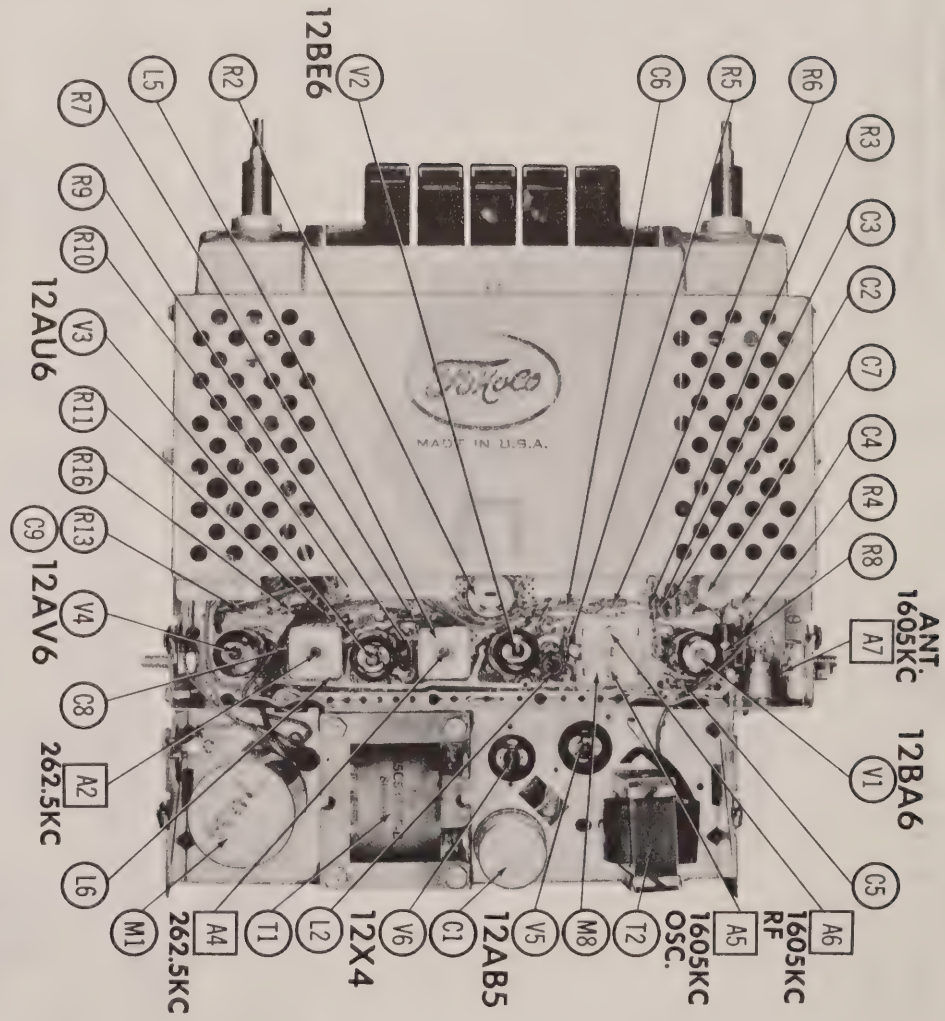
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA MOTOROLA PART No.	IRC PART No.	NOTES
R3	470K		6R6032	BTS-470K	
R4	10K	1	6K122319	BTA-10K	
R5	22K		6R6028	BTS-22K	
R6	47K		6R6056	BTS-47K	
R7	1Meg		6R6004	BTS-1Meg	
R8	12K	2	6K121488	BTB-12K	
R9	220Ω		6R3933	BTS-220	
R10	2.2Meg		6R3927	BTS-2.2Meg	
R11	47K		6R6056	BTS-47K	
R12	27K		6R6434	BTS-27K	
R13A	4.7Meg		†51B337111	BTS-4.7Meg	
B	1Meg			BTS-1Meg	
R14	220K		6R6015	BTS-220K	
R15	220Ω	1	6R6389	BTA-220	
R16	39Ω		6R2085	BTS-39	
R17	2200Ω	1	6A533220	BTA-2200	

† Items R13A, R13B, C9A, C9B, C9C, C9D and C9E are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	12.6VCT @ 1.3A	460VCT @ .047A			25C535035-B	V3903	P-2978	P-6489	22R52	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	7000Ω	3-4Ω	25B534936-B						

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	RCA TYPE No.	
SP1	6" X 9"	PM	3-4Ω	1K538019			

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	17Ω		24K536048				Core part #76K536035
L2	RF Choke	4.8Ω		24A536994				
L3	RF Coil	5.5Ω		24K536042				Core part #76K536035
L4	Osc. Coil	.8Ω	3Ω	24K536043				Core part #76K536036
L5	Input IF	48Ω	48Ω	24K537218				
L6	Output IF	45Ω	45Ω	24C536543				
L7	Fil. Choke	.3Ω		24A536434				
L8	Vib. Hash Choke	.1Ω		24A534494				21.2 Microhenries

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				MOTOROLA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	12.6V	115∿	48B522000	6301	G859	6301	

FUSES

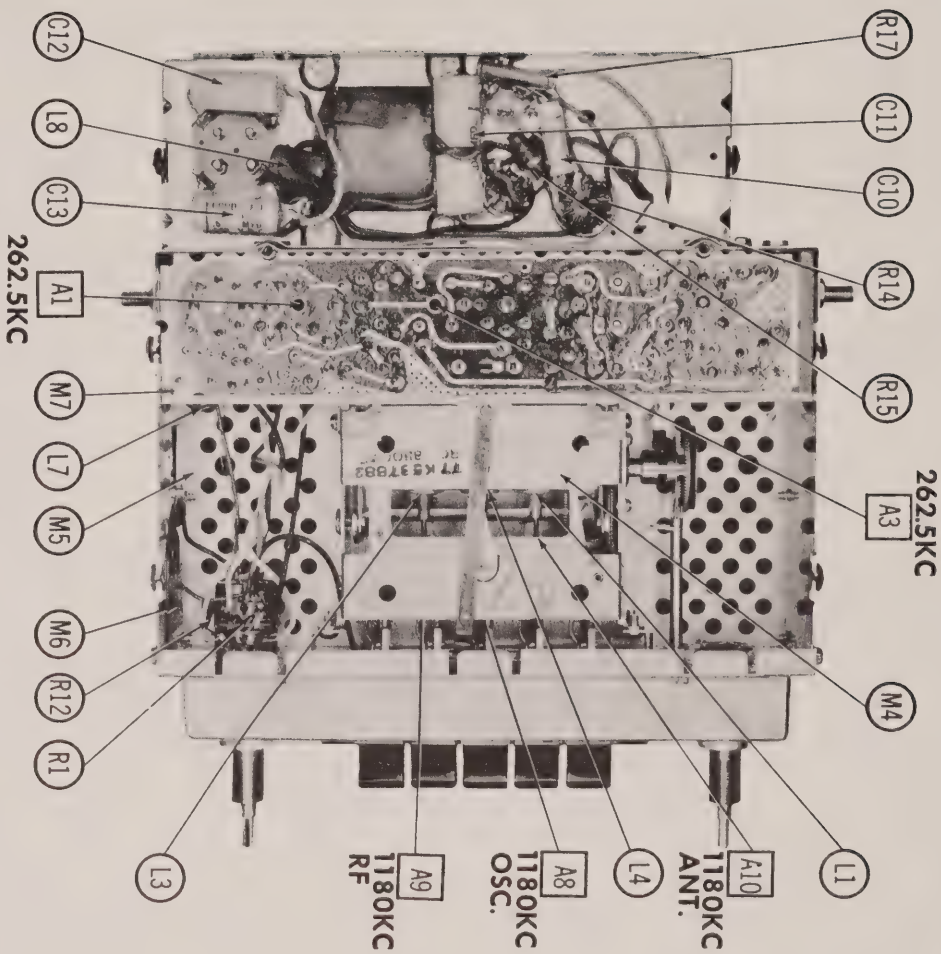
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	1AG	5A 32V	65R122345	9K534968	301005. (1AG-5A)	155004	AGA5	HRF

MISCELLANEOUS

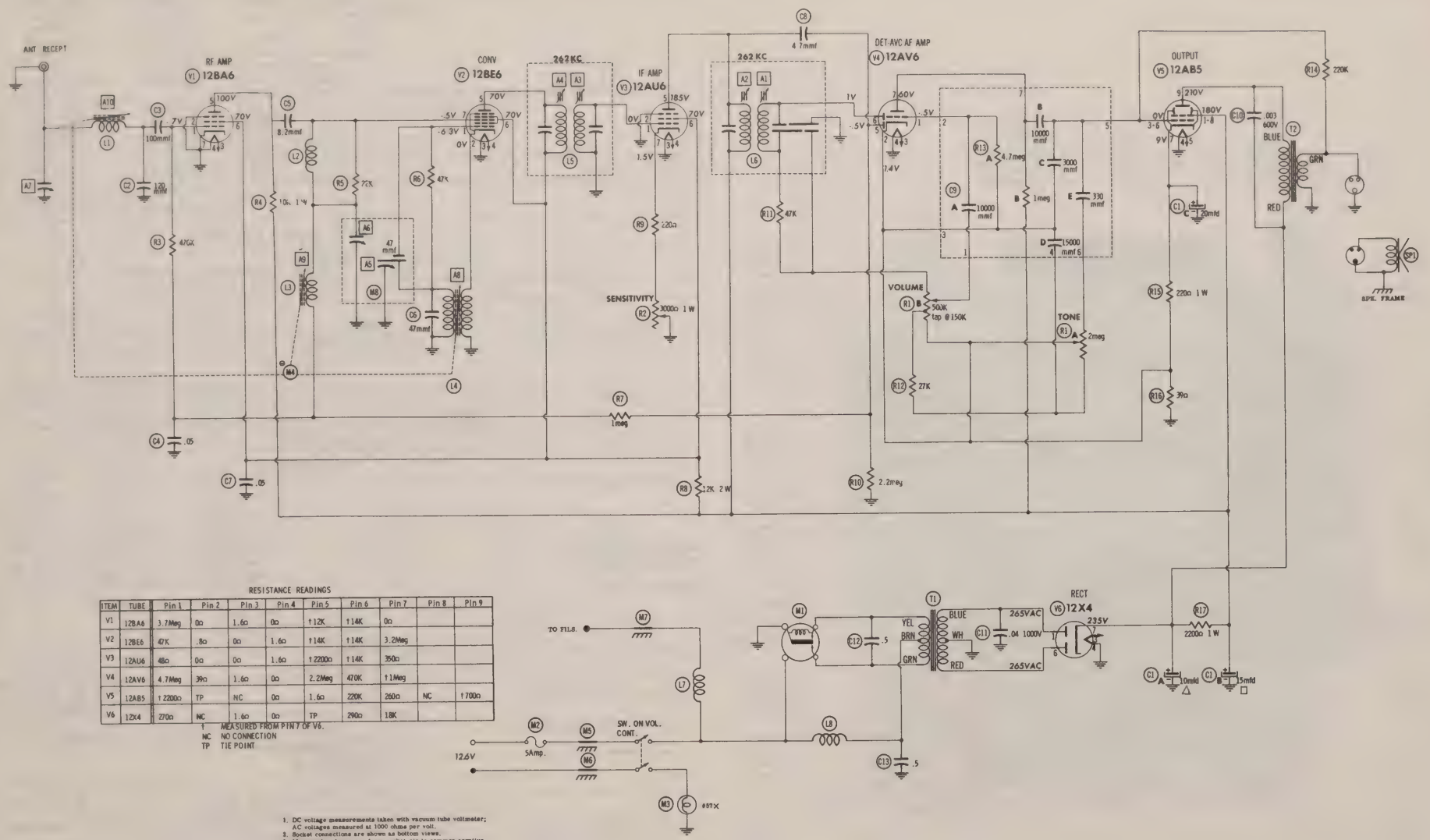
ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	Dial Light	65T535060	#57X
M4	Tuner	77K537882 *	(AT-188) Permeability (complete) Includes L1, L3 and L4
M5	Spark Plate	64K532087	Power Input Lead
M6	Spark Plate	64K532087	Dial Light Lead
M7	Spark Plate	64K532087	Filament
M8	Trimmer Cap.	20B536437	Dual: Osc. trimmer, A5 (370-450MMF) & RF trimmer, A6 (230-330MMF). Unit also consists of 47MMF fixed capacitor
A7	Trimmer Cap.	20K534810	Ant. (5-80MMF)
	Knob	36B534451	Dummy & tone
	Knob	36A534450	On-off-volume & tuning
	Pushbutton	38B534937	5 used
	Dial Scale	34C534863	
	Dial Pointer	1A535313	Used with tuner part #77K537881
	Dial Pointer	1K536034	Used with tuner part #77K537882

* Alternate tuner part #77K537881 (AT-183).

CHASSIS—BOTTOM VIEW



FORD
MODEL 66MFP (FDR-18805-B1)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BA6	3.7Meg	0Ω	1.6Ω	0Ω	†12K	†14K	0Ω		
V2	12BE6	47K	.8Ω	0Ω	1.6Ω	†14K	†14K	3.2Meg		
V3	12AU6	48Ω	0Ω	0Ω	1.6Ω	†2200Ω	†14K	350Ω		
V4	12AV6	4.7Meg	39Ω	1.6Ω	0Ω	2.2Meg	470K	†1Meg		
V5	12AB5	†2200Ω	TP	NC	0Ω	1.6Ω	220K	260Ω	NC	†700Ω
V6	12X4	270Ω	NC	1.6Ω	0Ω	TP	290Ω	18K		

† MEASURED FROM PIN 7 OF V6.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on components values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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*TRADE MARK

GENERAL ELECTRIC MODELS 21C133, -UHF, 21C134, -UHF, 21C135, -UHF, 21C136, -UHF, 21C141, UHF, 21C142, -UHF ("ST" Line)

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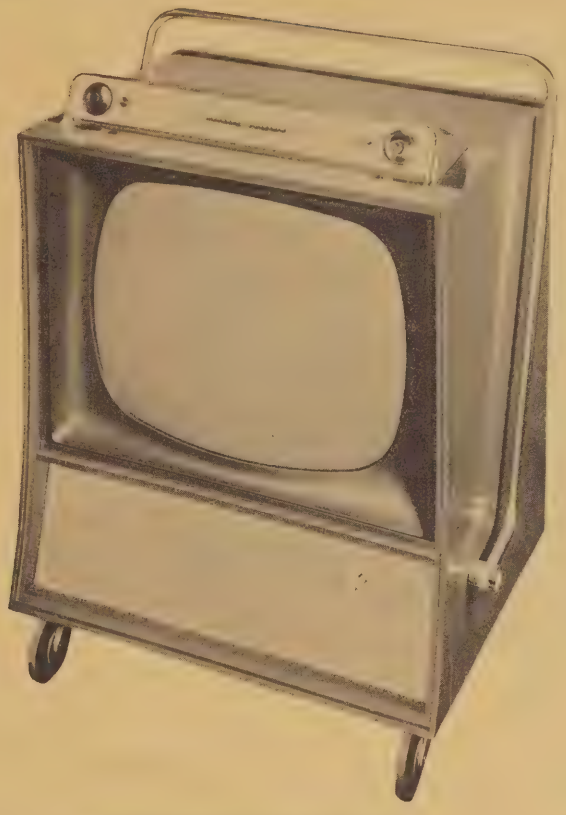

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GENERAL ELECTRIC MODEL 21C133

TRADE NAME	General Electric	MODELS	CHASSIS
		21C133, 21C133-UHF, 21C134, 21C134-UHF, 21C135, 21C135-UHF, 21C136, 21C136-UHF, 21C141, 21C141-UHF, 21C142, 21C142-UHF. . . . . "ST" line	
MANUFACTURER	General Electric Co., Appliance & Television Receiver Div., Electronics Park, Syracuse, N. Y.		
TYPE SET	Television Receiver		
TUBES	Seventeen		
POWER SUPPLY	110-120 Volts AC - 60 Cycles	RATING 1.62 Amp. @ 117 Volts AC	
TUNING RANGE -	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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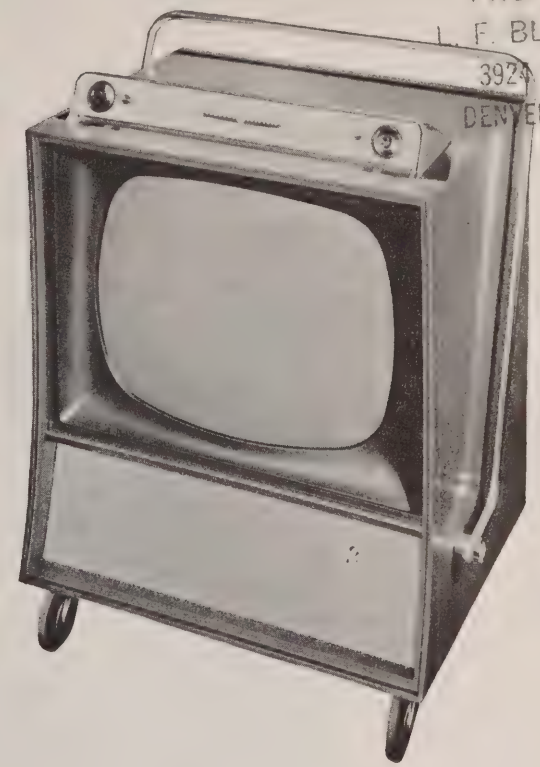

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 6 push-on type control knobs from top panel of cabinet.
2. Remove 7 metal screws. Remove rear cover.
3. Disconnect speaker lead.
4. Remove 6 chassis bolts also 1 hex nut and 1 metal screw holding top panel controls to cabinet.
5. Remove 1 hex nut and 3 metal screws holding tuner brackets.
6. Remove chassis.
7. Remove 2 speaker nuts. Remove speaker.

MODEL	CHASSIS
21C133	"ST" line

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of 7 metal screws. Remove rear cover. The adjustments are accessible, one at a time, through the small hole in the rear of tuner case.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 4 metal screws holding metal molding at the bottom edge of the safety glass. Remove metal molding and safety glass. (The mask and side rails will also come out.) Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 11.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator can be made from the rear of the set. Set horizontal hold control to the center of its range and adjust the horizontal stabilizer coil (L26) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L24) located on the tube side of the chassis.

FUSES

One fuse is used for horizontal sweep circuit protection. (For location see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is centered properly.

GENERAL ELECTRIC MODELS 21C133, -UHF, 21C134, -UHF, 21C135, -UHF, 21C136, -UHF, 21C141, UHF, 21C142, -UHF ("ST" Line)

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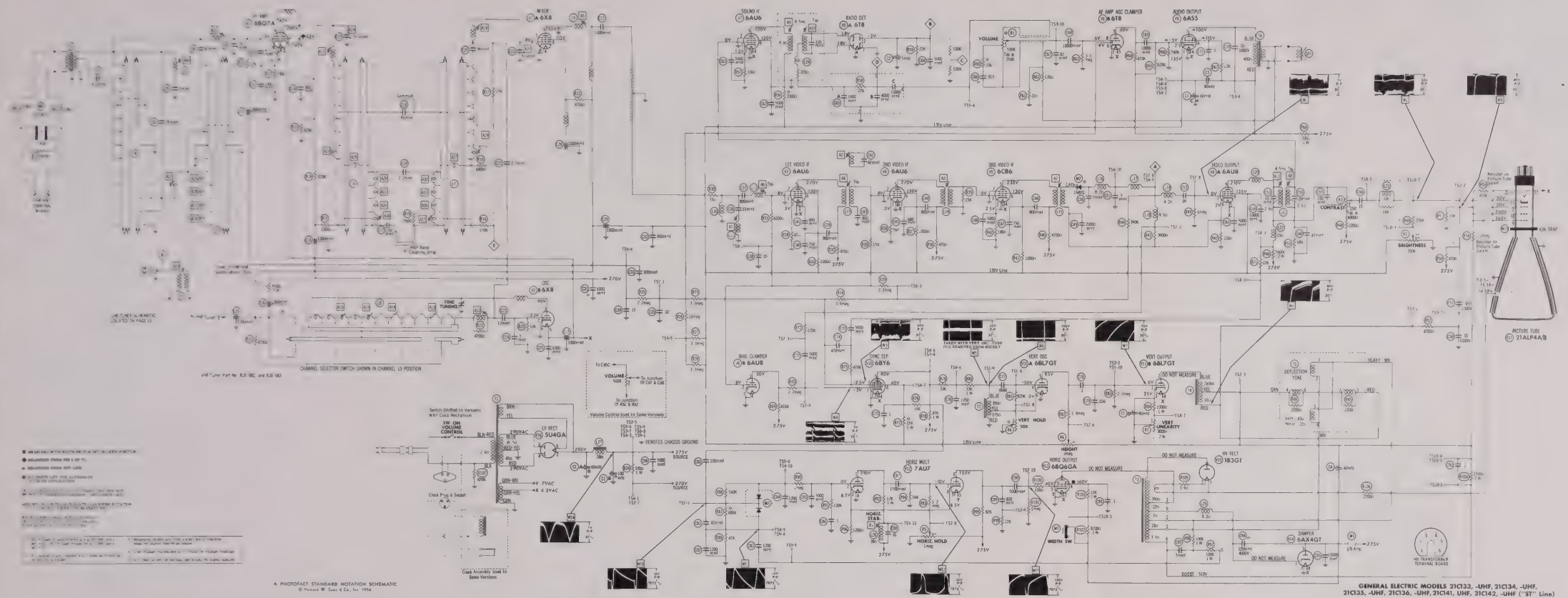
G484

DATE 11-56 SET 337 FOLDER 7



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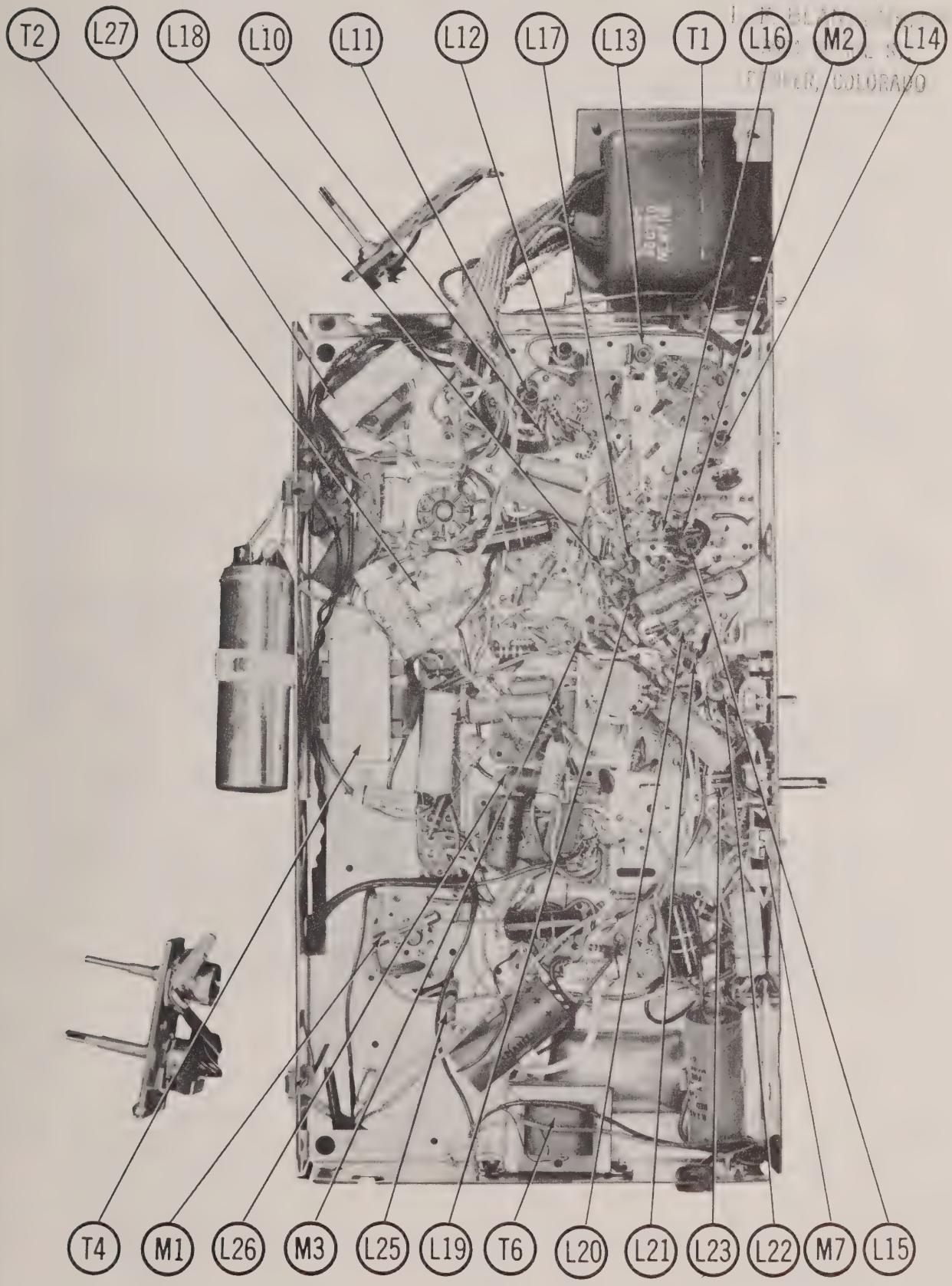
CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

GENERAL ELECTRIC MODELS 21C133, -UHF, 21C134, -UHF, 21C135, -UHF, 21C136, -UHF, 21C141, -UHF, 21C142, -UHF ("ST" Line)

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

SET 337 FOLDER 7

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal output tube (V13) from its socket. Do not remove the horizontal oscillator tube (V12) to disable the high voltage. Allow twenty minutes for warm-up period for receiver and test equipment.

VIDEO IF ALIGNMENT

Set fine tuning control fully counter clockwise.
Connect the negative lead of a 3 volt bias supply to the ungrounded side of C36, the positive lead to chassis.
Set contrast control fully clockwise.
If during adjustment two peaks occur, use the one with the slug farthest from the chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to tube shield floating over 6X8 converter tube. Low side to chassis.	44MC (10MC Swp)	47.25MC	11	Vert. amp. thru 10K to point (A). Low side to chassis.	A1, A2	Adjust for MINIMUM amplitude at marker.
2.	"	"	"	42.5MC	"	"	A3	Adjust to place marker at 40 to 55% of curve as in Fig. 1.
3.	"	"	"	45.75MC	"	"	A4	Adjust to place marker at 45% on curve as in Fig. 1.
4.	"	"	"	42.5MC 45.75MC	"	"	A5	Adjust A4 for width of peak region of response curve.
5.	"	"	"	"	"	"	A6, A7	Adjust A5 and A6 for symmetry of curve. Recheck positions of markers and retouch if necessary.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

If a signal generator providing a 4.5MC signal of crystal accuracy is not available, restore the receiver to normal operating conditon and tune in a TV station. Connect VTVM and adjust A8, A9 and A10 as in steps 6 and 7.
Connect two matched 100KΩ (±1%) resistors in series from point (B) to chassis. The junction of these two resistors is alignment point (C) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	.01MFD	High side to point (A). Low side to chassis.	4.5MC (unmod)	Any unused channel.	DC probe to point (B). Common to chassis.	A8, A9	Adjust for maximum deflection.
7.	"	"	"	"	DC probe to point (D). Common to point (C).	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.01MFD	High side to point (A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any unused channel.	Vert. amp. to point (B). Low side to chassis.	A8, A9	Disconnect stabilizing capacitor C2. Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
7.	"	"	"	"	"	Vert. amp. to point (D). Low side to chassis.	A10	Reconnect C2. Adjust A10 so that 4.5MC marker occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	.001MFD	High side to point (A). Low side to chassis.	Not used.	4.5MC (400∿ Mod)	11, 12 or 13	Vert. amp. thru detector (Fig. 4) to pin 11 (cathode) of picture tube. Low side to chassis.	A11	Adjust for MINIMUM 400∿ indication. If necessary, use maximum scope gain.

VHF OSCILLATOR ALIGNMENT

Connect bias as under "Video IF Alignment".
Set the fine tuning control two-thirds from its fully counter clockwise position and leave it in this position during the entire oscillator alignment.
Remove the 300 ohm transmission line from the tuner input terminals.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω carbon resistors.	Across VHF antenna terminals with 120Ω in each lead.	213MC (10-15MC Swp)	211.25MC 215.75MC	13	Vert. amp. thru 10K to point (A). Low side to chassis.	A12	Adjust so that video marker falls at 50% on response curve as in Fig. 5. Sound marker should fall in trap notch.
10.	"	"	201MC (10-15MC Swp)	199.25MC 203.75MC	11	"	A13	"
11.	"	"	189MC (10-15MC Swp)	187.25MC 191.75MC	9	"	A14	"
12.	"	"	85MC (10-15MC Swp)	83.25MC 87.75MC	6	"	A15	"
13.	"	"	69MC (10-15MC Swp)	67.25MC 71.75MC	4	"	A16	"

ALIGNMENT INSTRUCTIONS (cont)

VHF RF AND MIXER ALIGNMENT

Remove the 300 ohm transmission line from the tuner input terminals.
Connect bias as under "Video IF Alignment".
If L4, L11 or L7 requires adjustment, (normally adjustment is not required) the tuner cover must be removed and replaced before and after each adjustment.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

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	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	Fig. 4	Thru coupling network (Fig. 4) across primary of antenna coil (L1).	213MC (15MC Swp)	211. 25MC 215. 75MC	13	Vert. amp. thru 10K to point (E). Low side to chassis.	A17, A18	Adjust for response of maximum amplitude and symmetry similar to Fig. 6. If tilt exceeds 15%, it may be necessary to compress or expand coil turns of L4. Use insulated tool to prevent shorting B+.
15.	"	"	177MC (15MC Swp)	175. 25MC 179. 75MC	7	"	A19, A20, A21	Adjust for response curve similar to Fig. 6. A19 and A20 affect the bandwidth. Adjust A21 for maximum gain and MINIMUM tilt.
16.	"	"	207MC (15MC Swp)	205. 25MC 209. 75MC	12	"		Check each channel for response similar to Fig. 6. If not within limits of any high band channel, make compromise adjustments of A17 thru A21 with channel switch set to that channel. Recheck all other high band channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199. 25MC 203. 75MC	11			
			195MC (15MC Swp)	193. 25MC 197. 75MC	10			
			189MC (15MC Swp)	187. 25MC 191. 75MC	9			
			183MC (15MC Swp)	181. 25MC 185. 75MC	8			
17.	"	"	85MC (15MC Swp)	83. 25MC 87. 75MC	6	"	A22, A23, A24	Adjust for maximum amplitude and flat-topped response curve similar to Fig. 7.
18.	"	"	79MC (15MC Swp)	77. 25MC 81. 75MC	5	"	A25, A26, A27	Adjust for response similar to Fig. 7. If necessary, adjust by compressing or expanding coil turns to obtain response similar to Fig. 7.
19.	"	"	69MC (15MC Swp)	67. 25MC 71. 75MC	4	"	A28, A29, A30	"
20.	"	"	63MC (15MC Swp)	61. 25MC 65. 75MC	3	"	A31, A32, A33	"
21.	"	"	57MC (15MC Swp)	55. 25MC 59. 75MC	2	"	A34. A35, A36	"

UHF 40MC ALIGNMENT

Connect the negative lead of a 3 volt bias supply to the tuner AGC line (white wire). Connect the positive lead to tuner chassis.
Switch channel selector to UHF position.
Remove shield from L22 and disconnect IF output link from R30. Connect a 68 ohm resistor across output of IF cable.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
22.	Fig. 9	High side thru network (Fig. 9) to point (F). Low side to chassis.	620MC (20MC Swp)	40. 5MC 45. 75MC	Any UHF position.	Vert. amp. thru 10K to point (E). Low side to chassis.	A37, A38, A39	Adjust for response similar to Fig. 8. Adjust A37 for maximum gain and correct position of 40. 5MC marker. Adjust A38 for maximum gain and correct position of 45. 75MC marker. Adjust A39 for maximum amplitude and MINIMUM tilt. Reconnect IF link.

VHF IF TRAP ALIGNMENT

The IF trap (A40) may be aligned by tuning in a station on which the interference occurs and by adjusting A40 for minimum interference in the picture. Be careful not to adjust A40 so that it attenuates at channel 2.
If the frequency of the interfering signal is know, the trap may be aligned as in step 23.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
23.	Fig. 4	Thru network (Fig. 4) across VHF antenna terminals.	44MC (10MC Swp)	Set to freq. of interfering signal Normally adjusted at 43. 5MC.	2	Vert. amp. thru 10K to point (A). Low side to chassis.	A40	Connect bias as under "UHF 40MC Alignment". Adjust for MINIMUM marker amplitude. Remove bias and all test equipment. Replace V13 in its socket.

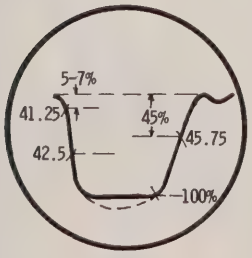


FIG. 1

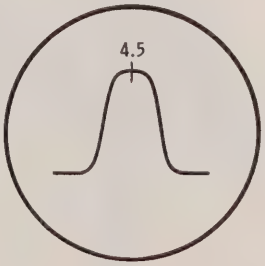


FIG. 2

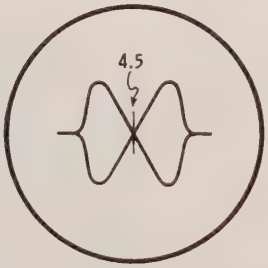


FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

UHF TUNER ALIGNMENT

Set A40 to 43.5MC to provide VHF marker (notch) on response curve. Refer to step 23 for adjustment of A40. Connect bias as under "Video" IF Alignment". Set channel selector to UHF position.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
24.	Fig. 10	Across UHF antenna terminals thru network (Fig. 10).	460MC (20MC Swp)	460MC	Maximum position.	Vert. amp. thru 10K to point (E). Low side to chassis.	A41	Adjust until marker coincides with notch caused by 43.5MC trap (A40) on response curve as in Fig. 11.
25.	"	"	910MC (20MC Swp)	910MC	"		A42	Adjust A42 until 910MC marker coincides with notch on response curve (Fig. 11). Repeat steps 24 and 25 until markers coincide on both ends of the UHF band.
26.	"	"	530MC (20MC Swp)	530MC	See remarks.			Set UHF tuning dial until 530MC marker coincides with notch as in Fig. 11. Connect a short clip lead across points (G) and (H).
27.	"	"	"	"	See remarks. (Step 21)	Vert. amp. thru 10K to pin 6 (plate) of V7 (6AU6). Low side to chassis.	A43, A44	Disconnect shielded cable from VHF tuner. Connect a 33Ω resistor from center of cable to shield. Connect input of first sound IF amplifier (V7-pin 1) across 33Ω resistor. Adjust A43 and A44 for maximum amplitude and MINIMUM tilt to provide symmetrical response similar to Fig. 6. Remove resistor and reconnect cable to VHF tuner socket. Remove clip lead.
28.	"	"	880MC (20MC Swp)	880MC	See remarks.	Vert. amp. thru 10K to point (E). Low side to chassis.		Set UHF tuning dial until 880MC marker coincides with notch as in Fig. 11. Connect clip lead across points (G) and (H).
29.	"	"	"	"	See remarks. (Step 23)	Vert. amp. thru 10K to pin 6 (plate) of V7 (6AU6). Low side to chassis.	A45, A46	Disconnect shielded cable from VHF tuner. Connect a 33Ω resistor from center of cable to shield. Connect input of first sound IF amplifier (V7-pin 1) across 33Ω resistor. Adjust A45 and A46 for symmetrical response as in Fig. 11. Remove clip lead. Disconnect resistor and reconnect cable to VHF tuner. If necessary, repeat steps 24 thru 29 until symmetrical response similar to Fig. 11 is obtained.

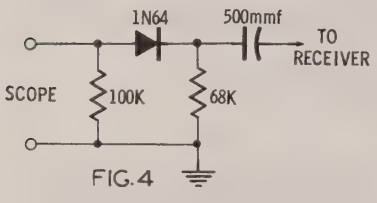


FIG. 4

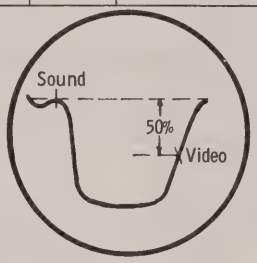


FIG. 5

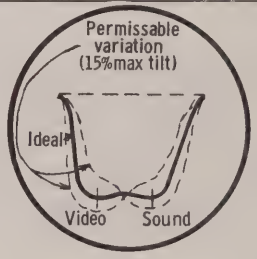


FIG. 6

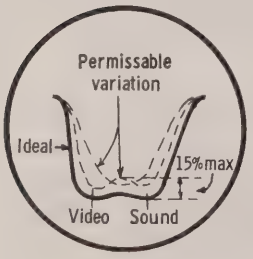


FIG. 7

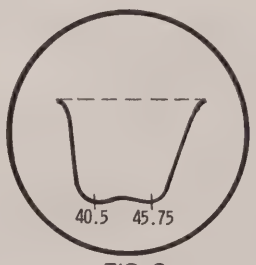


FIG. 8

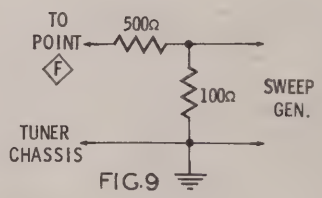


FIG. 9

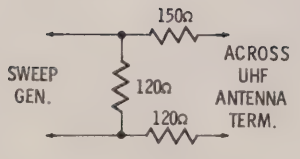


FIG. 10

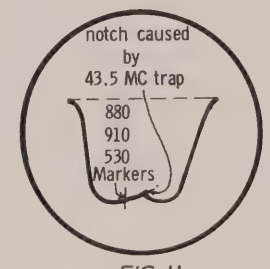
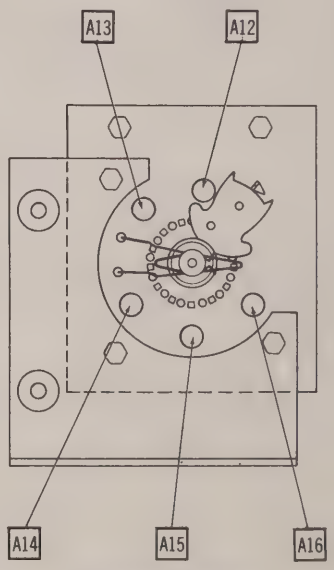
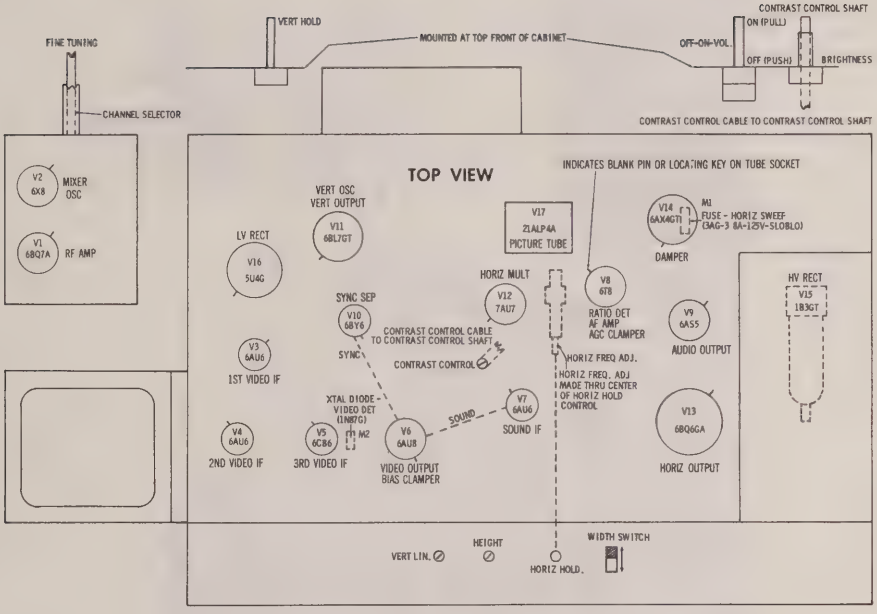


FIG. 11



Oscillator Adjustments

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

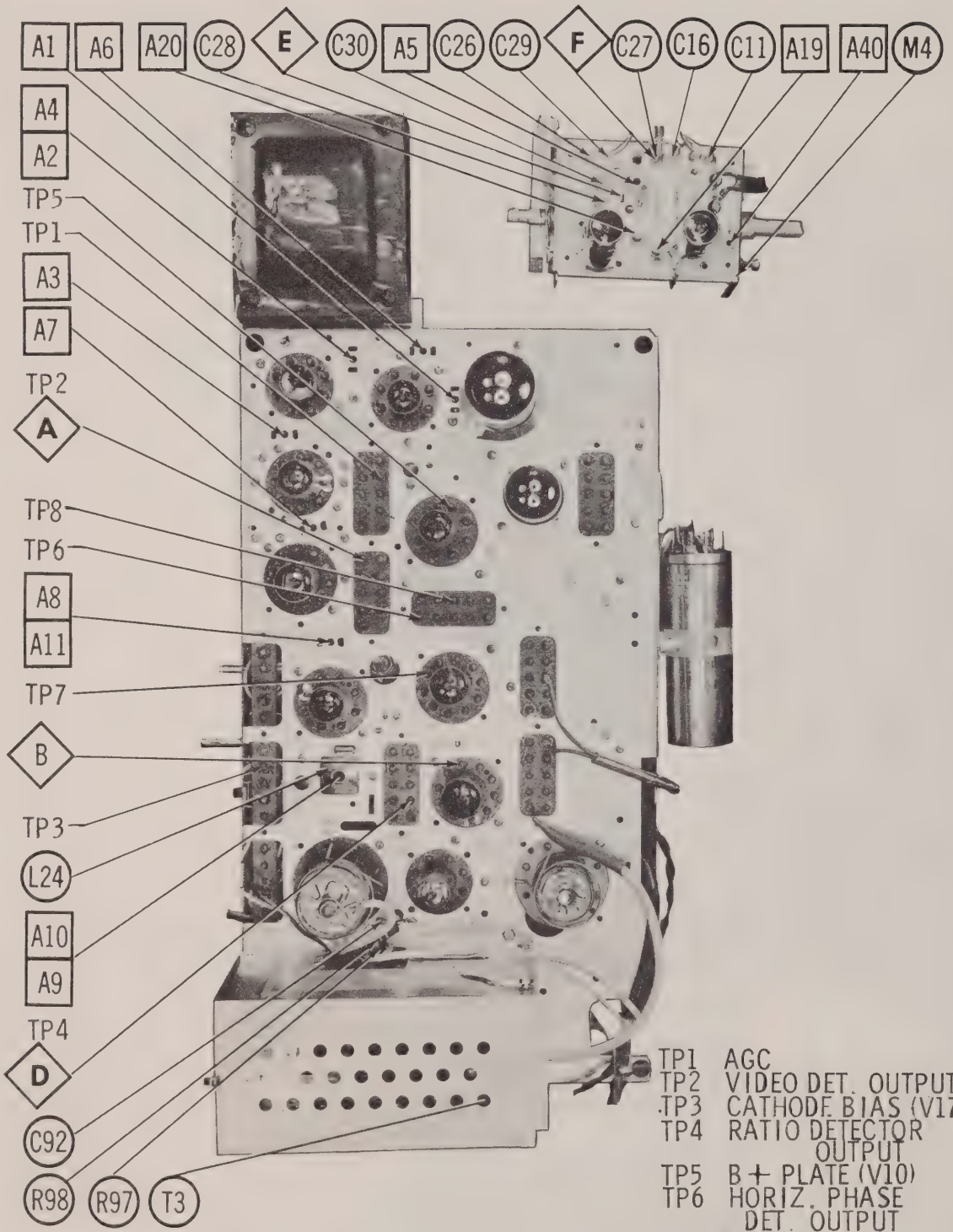
The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V16

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6, V9
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V17
Has pic, no sound - V7, V8, V9

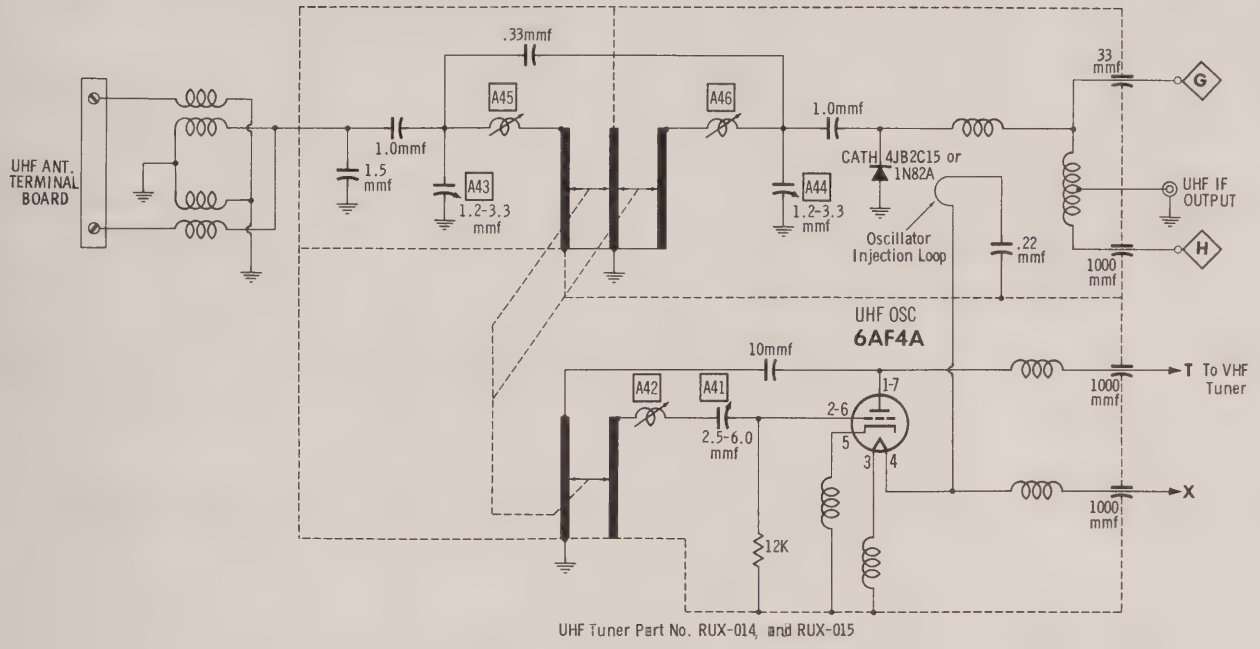
SYNC FAILURE
No vert. sync - V10, V11
No horiz. sync - V10, V12
No vert. or horiz. sync - V6, V10

SWEEP FAILURE
No raster, has sound - V12, V13, V14, V15, V17, Fuse (M1)
No vertical deflection - V11
Poor vert. linearity or foldover - V11
Poor horiz. linearity or foldover - V12, V13, V14
Narrow picture - V12, V13, V14, V15, V16
Vert. off freq. - V10, V11
Horiz. off freq. - V10, V12



TP1	AGC	−.8V
TP2	VIDEO DET. OUTPUT	2V
TP3	CATHODE BIAS (V17)	50V
TP4	RATIO DETECTOR OUTPUT	−.2V
TP5	B + PLATE (V10)	90V
TP6	HORIZ. PHASE DET. OUTPUT	0V
TP7	B + (V12)	230V
TP8	B + Line	275V

CHASSIS TOP VIEW



UHF Tuner Part No. RUX-014, and RUX-015

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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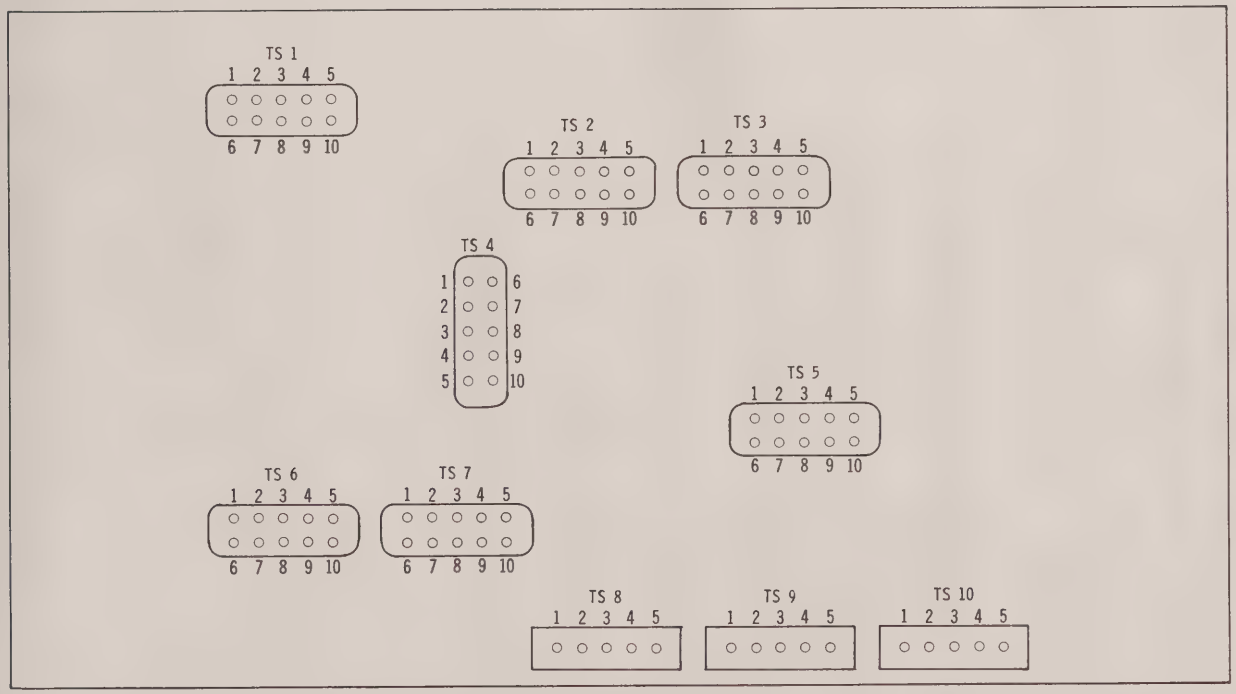
UHF TUNER SCHEMATIC



TERMINAL LOCATION CHART

SET 337 FOLDER 7

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	6BQ7A	
V2	Mixer-Osc.	6X8	
V3	1st Video IF Amp.	6AU6	
V4	2nd Video IF Amp.	6AU6	
V5	3rd Video IF Amp.	6CB6	
V6	Video Output- Bias Clamper	6AU6	
V7	Sound IF Amp.	6AU6	
V8	Ratio Det-AF Amp. - AGC Clamper	6T8	
V9	Audio Output	6AS5	
V10	Sync Seperator	6BY6	
V11	Vert. Osc. -Vert. Output	6BL7GT	
V12	Horiz. Mult.	7AU7	
V13	Horiz. Output	6BQ6GA	
V14	Damper	6AX4GT	
V15	HV Rectifier	1B3GT	
V16	LV Rectifier	5U4GA	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	General Electric	CBS	GENERAL ELECTRIC	SYLVANIA	
V17	21AL4PA/B ①	21AL4PA/B ①	21AL4PA/B ①	21AL4PA/B ①	① Aluminized ② Silver Screen "65"
		21ALP4A/B ①	21AL4PA ①		
		21ALP4B ①			
		21AL4P4			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT	General Electric PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	●50	350	RCE-134	AFDH-99-50		FMH19.67	TMQ-135		R2356 *
B	●100	150							
C	●80	200							
D	65	75							
C3	5	50	RCE-174	SRE50V5	BR550	TC30	TD-5-50	MMT-0505	TVA-1303
C4	90	350	RCE-133	PRS450V90	A031	TC90	TD-40-350	MT-4590	TVA-1716
C4	40	450	RCE-133	PRH450V40	BR4045	TC78	TD-40-450	FM-4540	TVA-1713

* Non-canlog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA								NOTES
	CAP.	VOLT	General Electric PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	CRL PART No.	MALLORY PART No.	SPRAGUE PART No.		
C5	5		RCW-3123	MPD-D23		SG31	MPGA-050	ET-555			
C6	25			MTSD-D2S5	TCM-25	MG25	MTSGC-250		5TCU-Q25		
C7	6.3		RCW-3240								
C8	47		RCW-3145		TCL-47						
C9	.5-3		RCC-090		539-3		3125-01-0R5	CY505A			
C10	8.3			MPD-D8.3		SG35	MPGA-8R3				
C11	1000		RCW-3127								
C12	1000		BPD-001	DD-102	KD69	001-001	001-001	DC-521	5HK-D1		
C13	3-8		RCT-090		538-3		3125-01-0R5	CY505A	5GA-T6		
C14	500		RCW-3027	SH30	DD-001	C067	511-031				
C15	1000		RCW-3127								
C16	1000		RCW-3127								
C17	100		RCW-3144								
C18	01										
C19	3.3			MPD-H3.3	TCE-3R3	TS35	MPGA-3R3		5TCCB-V33		
C20	39		RCW-3180	MTSD-H39	TCE-39		MTSGC-390				
C21	5-8		RCT-090		539-3		3125-01-0R5	CY505A			
C22	8.7		RCW-3333								
C23	30		RCW-3339								
C24	01		RCW-3146								
C25	1000			BPD-001	DD-102	KD69	001-001	DC-521	5HK-D1		
C26	1000		RCW-3127								
C27	1000			BPD-001	DD-102	KD69	001-001	DC-521	5HK-D1		
C28	1000		RCW-3127								
C29	1000		RCW-3127								
C30	1000		RCW-3127								
C31	1000			BPD-001	DD-102	KD69	001-001	DC-521	5HK-D1		Note 1
C32	600		RCW-3037	SH30	DD-001	C067	511-031		5GA-T8		
C33	600		RCW-3037	SH30	DD-801	C067	511-831		5GA-T8		
C34	.15	300		PSHM-15		CUB2P15		PT4015	5TM-P15		
C35	.01	300	RCW-3247	BPD-02	DF-303	CUB2E3	517-02	PT413	5TM-S2		
C36	15		RCG-018	MPD-D15	TCE-15	S021	MPGA-150		5TCC-Q25		
C37	600		RCW-3037	SH30	DD-801	C067	511-831		5GA-T8		
C38	.05	200		BPD-05	DF-503	CUB2E5		PT415	5TM-S5		
C39	600			SH30	DD-801	C067	511-831		5GA-T8		
C40	750		RCW-3211	DM-00075	DD-751	C066	511-751	UC-5375	5GA-T75		
C41	600		RCW-3037	SH30	DD-801	C067	511-831		5GA-T8		
C42	47		RCG-077	MPD-D147	TCE-47	S033	MPD-S38-47C	ET-5447	5TCC-Q47		
C43	600		RCW-3037	SH30	DD-801	C067	511-831		5GA-T8		
C44	600		RCW-3037	SH30	DD-801	C067	511-831		5GA-T8		
C45	600		RCW-3221	BPD-00068	DD-681	C067	511-681	UC-5368	5GA-T68		
C46	600		RCW-3037	SH30	DD-801	C067	511-831		5GA-T8		
C47	750		RCW-3221	DM-00075	DD-751	C066	511-751	UC-5375	5GA-T75		
C48	1000		RCW-3034	BPD-001	DD-102	KD69	001-001	DC-521	5HK-D5		
C49	10000			BPD-02	DD-503	CUB2E5	517-02	PT413	5HK-S2		
C50	5		RCW-3123	MPD-D25	TCE-4R7	S021	MPGA-050	ET-555	5TCCB-V47		
C51	5		RCW-3123	MPD-D25	TCE-4R7	S021	MPGA-050	ET-555	5HK-D5		
C52	.05	300	RCW-3249	BPD-05	DF-503	CUB2E5		PT415	5TM-S5		
C53	33		RCW-3289	MPD-D233	TCE-33	S029	MPGL-330	ET-5433	5TCC-Q33		
C54	10000		RCW-3044	BPD-01	DD-103	KD65	511-01	DC-511	5HK-S1		Note 2
C55	100		RCW-3181	SH100	DD-101	C054	GPUK-101	UC-5331	5GA-T1		
C56	.1	400		PMSM-1		CUB4P1S		PT403	4TM-P1S		
C57	.033	1000		PDSSM-033		CUB3E3		PT313	3DTM-S33		
C58	.01	1000		PDSSM-01	DD-103	CUB3E1		PT311	3DTM-S1		
C59	30		RCW-3173	MPD-D130	TCE-30	S023	MPGK-300	ET-543	5TCC-Q3		
C60	47		RCW-3243	MPD-D247	TCE-47	S033	MPD-S38-47M	ET-5447	5TCC-Q47		
C61	5600		RCW-3034	BPD-056	DD-503	KD60	511-056	DC-535	5HK-D5		
C62	5000		RCW-3034	BPD-005	DD-503	KD60	511-005	DC-525	5HK-D5		
C63	5000		RCW-3034	BPD-005	DD-503	KD60	511-005	DC-525	5HK-D5		
C64	5000		RCW-3034	BPD-005	DD-503	KD60	511-005	DC-525	5HK-D5		
C65	5000					KD60	511-005	DC-525	5HK-D5		
C65A	1000					001-001		DC-521	5HK-D1		
B	6000		TREK-005	YPA-625	YPC-186	KD75	001-094	UC-5340	YPB-3		
C	16000					KD62	511-01	DC-511			
C66	67	300		BPD-035	DD05-153	CUB4E15	531-035		PT415	TTM-S15	Note 3
C67	82				TCN-82	N040	NT5D1-S30				
C68	5600		RCW-3188	BPD-01	DD-103	KD62	511-01	DC-511	5HK-S1		
C69	10000		RCW-3286	BPD-01	DD-103	KD62	511-01	DC-511	5HK-S1		
C70	01	1000		PDSSM-01	DD-103	CUB3E1		PT311	3DTM-S1		
C71	.1	400		P4SSM-1	DF-104	CUB4P1		PT401	4TM-P1		
C72	5000		RCW-3183	BPD-005	DD-503	KD60	511-005		5HK-D5		
C73	5000		RCW-3183	BPD-005	DD-503	KD60	511-005		5HK-D5		
C74	470		RCW-3239	BPD-00047	DD-471	KD60	511-471		5GA-T47		

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	General Electric PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C75	1	400	RCW-3187	P4SSM-1	DF-104	CUB4P1		PT401	4TM-P1	
C76	1200			1464-0023		CUB4E12	511-123			
C77	.0068	600								
C78	1	600		P6SSM-1	DF-104	CUB6P1		PT601	6TM-P1	
C79	.036		RCW-3238	P4SSM-033		CUB6E33		PT6133	6TM-S35	
C80	100		RCW-3234	NT50-D100	TCM-100	N043	NT5D1-101	NT-531	5TCU-T1	
C81	82		RCW-3233		TCN-82	N040	NT5D1-S30			
C82	1200		RCW-3187	1464-0023		1R5D12	511-123		MS-123	
C83	1200		RCW-3187	1464-0023		1R5D12	511-123		MS-123	
C84	1200		RCW-3187	1464-0023		1R5D12	511-123		MS-123	
C85	5000		RCW-3186	BPD-005	DD-503	KD60	511-005		5HK-D5	
C86	.01	300		P3SSM-1	DF-104	CUB3P1		DC-539	3TM-P1	
C87	1500	500	RCU-345	1464-0035		1R5D15	511-153		MCE496	
C88	01	600								
C89	820		RCW-3238	1464-00823		1R5T82	511-821		MS-182	
C90	5000		RCW-3188	BPD-005	DD-503	KD60	511-005	DC-539	5HK-D5	
C91	400			P4SSM-1	DF-104	CUB4P1		PT401	4TM-P1	
C92	5		RCW-3203	MPG-D25	TCS-4R7	S021	MPGA-060	ET-555	5TCCB-V47	
C93	.1	400		P4SSM-1	DF-104	CUB4P1		PT401	4TM-P1	
C94	220	4000		HVD-60-221		V5T22	6KV-221	DC60S33	60GA-T22	Note 4
C95	5000		RCW-3186	BPD-01	DD-103	KD62	511-01	DC-511	5HK-S1	
C96	5000		RCW-3034	BPD-005	DD-503	KD60	511-005	DC-535	5HK-D5	

† Items C85A, C85B, C85C and R58 are combined in one unit.
Note 1. Some versions may use 600MMF unit (part #RCW-3187) in this application.
Note 2. Some versions may use 5000MMF unit (part #RCW-3434) in this application.
Note 3. Used in console models only.
Note 4. Some versions may use 300MMF unit (part #RCW-3246) in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST ANCE	WATTS	General Electric PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	RRC-363	ABT-54				Volume tapped ⑤ 250K-Note 1
B	Shaft		Not Req.	AR-9				Attach to R1A
C	Switch		Not Req.	XB-1				Attach to R1A
R2	200K	½	RRC-364	F1-33				Brightness - Note 2
R3A	15K	½	RRC-359	ABT-154		Q13-115X		Contrast tapped ⑥ 8000Ω
B	Shaft		Not Req.	AR-8		NQ		Attach to R3A
R4A	500K	½	RRC-365	AB-59	A47-500K-S	Q11-154	U50	Vert. Hold - Note 3
B	Shaft		Not Req.	AR-8	R2-3/8	NQ	DU-37	Attach to R4A
R5A	1Meg	½	RRC-366	B-59	A47-1Meg-S	Q11-127	U54	Horiz. Hold
B	Shaft		Not Req.	Not Req.	R2S-3	Not Req.	Not Req.	Attach to R5A
R6A	2Meg	½	RRC-361	AB-154	A47-2Meg-S	Q11-140	SU-59	Height
B	Shaft		Not Req.	AK-1	FKS-1/4	TQ	Not Req.	Attach to R6A
R7	3000	2	RRC-305		S6-3000			Vert. Linearity (Wire-wound)

Note 1: Versions 21C141 and 21C143 will use an alternate part no. RRC-360.
Note 2: Versions 21C141 and 21C143 will use an alternate part no. RRC-361.
Note 3: Versions 21C141 and 21C143 will use an alternate control part no. RRC-362.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	General Electric PART No.	IRC PART No.	
R8	330Ω			BTS-330	
R9	330Ω			BTS-330	
R10	470Ω			BTS-470	
R11	22K			BTS-22K	
R12	100Ω			BTS-100	
R13	82K			BTS-820K	
R14	820K			BTS-820K	
R15	100Ω			BTS-100	
R16	150K			BTS-150K	
R17	15K			BTS-15K	
R18	8200Ω			BTS-8200	
R19	560Ω			BTS-560	
R20	10K				
R21	4700Ω			BTS-4700	
R22	4700Ω			BTS-4700	
R23	470Ω			BTS-470	
R24	330Ω	1		BTA-330	
R25	2.2Meg			BTB-2.2Meg	
R26	10Meg 5%			BTB-10Meg 5%	
R27	3.3Meg			BTB-3.3Meg	
R28	3.3Meg			BTB-3.3Meg	
R29	3.3Meg			BTB-3.3Meg	
R30	33Ω			BTB-33	
R31	8200Ω 5%				
R32	470Ω			BTB-470	
R33	1000Ω			BTB-1000	
R34	47Ω			BTB-47	
R35	15K				
R36	470Ω			BTB-470	
R37	1000Ω			BTB-1000	
R38	56Ω			BTB-56	
R39	15K				
R40	4700Ω			BTB-4700	
R41	1000Ω			BTB-1000	
R42	180Ω			BTB-180	
R43	3900Ω			BTB-3900	
R44	390K			BTB-390K	
R45	1Meg			BTB-1Meg	
R46	5600Ω	2		BTB-5600	
R47	100Ω			BTB-100	
R48	2200Ω			BTB-2200	
R49	270K			BTB-270K	
R50	470K			BTB-470K	
R51	33K			BTB-33K	
R52	4700Ω			BTB-4700	
R53	470K			BTB-470K	
R54	1.5Meg			BTB-1.5Meg	
R55	68K			BTB-68K	
R56	3300Ω			BTB-3300	Note 1
R57	330Ω			BTB-330	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	General Electric PART No.	IRC PART No.	
R59	22K		†R8K-005	BTS-22K	
R59	25K			BTS-22K	
R60	33K			BTS-33K	Note 2
R61	22Ω			BTS-22	
R62	120Ω			BTS-120	
R63	3.3Meg			BTS-3.3Meg	
R64	470K			BTS-470K	
R65	680K 5%			BTS-680K 5%	
R66	560K 5%			BTS-560K 5%	
R67	15K			BTS-15K	
R68	330Ω	1		BTA-330	
R69	470K			BTS-470K	
R70	1.5Meg			BTS-1.5Meg	
R71	33K			BTS-33K	
R72	150K			BTS-150K	
R73	3.3Meg 5%			BTS-3.3Meg 5%	
R74	3.3Meg			BTS-3.3Meg	
R75	470K			BTS-470K	
R76	33K			BTS-33K	
R77	1K	1		BTA-1K	Note 3
R78	47K	1		BTA-47K	
R79	33K			BTS-33K	
R80	33K	1		BTA-33K	
R81	330K			BTS-330K	
R82	1.5Meg			BTS-1.5Meg	
R83	3.3Meg			BTS-3.3Meg	
R84	1000Ω			BTA-1000	
R85	2200Ω				
R86	2300Ω				
R87	560K			BTS-560K	Note 4
R88	560K 5%			BTS-560K 5%	
R89	47K			BTS-47K	
R90	1Meg				
R91	330K				
R92	15K	1			
R93	1.5Meg				
R94	56K				
R95	91K				
R96	1500Ω			BTS-1500	
R97	330K	1			
R98	330K	1			
R99	12K				
R100	100Ω				
R101	1Meg				
R102	82000Ω	1			
R103	10K	2			
R104	1500Ω	2		BTS-1500	
R105	5.9Ω		RRW-139	BW1-5.9	
R106	2200Ω			BTS-2200	
R107	470K			BTS-470K	

† Items R58, C85A, C85B, C85C are combined in one unit.
Note 1: Some versions use 47K in this application.
Note 2: Used in console models only.
Note 3: Some versions use 33K 1W in this application.
Note 4: Some versions use 560K 1W 5% in this application.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	General Electric PART No.	Hallderson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @1.65A	550VCT @.320A	5V @ 3A	7V @.475A 6.3V @8.5A	RTP-331					

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							
		General Electric PART No.	Hallderson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert. Osc. Trans.	RLC-137	B6705 ①	A-3004 ①		V404 ① ②	A-8126 ①	26A03 ①	A-13027 ①
T3	Horiz. Output Trans.	RTO-183							
T4	Vert. Output Trans.	RTO-184	21900 ② ③	A-3039 ②		V31S ②	A-8141 ②	26S64 ②	A-1047 ②
T5A	Yoke(90°)-Horiz(110 SMM)	RLD-071 ③	DF608 ② ③	MDF-R6 ②	23YD1 ② ③	Y90/71/47 ②	DY-13A ②	Y-14 ②	Y-40-1 ②
B	Vert(53MM)					D ②	D ②	D	D

① Connect blue lead to ground. Connect red and yellow leads to cathode (pin #8 of V14A); Connect green lead to grid (junction capacitor C77 and resistor R80).
② Drill new mounting hole(s).
③ Use 16 to 1 turns ratio.
④ Connect as auto trans.
⑤ Includes resistors R85 and R86.
⑥ Requires new clamping device.
⑦ Connect horiz. damping network across terms #3 and #7.
⑧ Connect horiz. yoke term #3 to horiz. output trans. term #2; horiz. yoke terms #1 to horiz. output trans term #L

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	General Electric PART No.	Hallderson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T6	5.1K	3-4Ω	RTO-140	XL107	A-2850	A-3677	24S51	S-3X	

SPEAKER

ITEM No.	RATINGS				REPLACEMENT DATA				NOTES
	SIZE	FIELD	V. C. IMP.		General Electric PART No.	QUAM PART No.	RCA TYPE No		
SP1	8"	PM	3-4Ω		S80D7	8A31	30S52		

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC	General Electric PART No.	MEISSNER PART No.	MERIT PART No.	MULLER PART No.	
L1	Ant. Trans.	00*	0Ω	RLA-046				*Tapped
L2	IF Trap	.8Ω		RLI-384				
L3	VHF Ant.Coils	0Ω		RBX-066				Channel 2 thru 5
L4	VHF Ant.Coils	0Ω		RBX-066				Channel 6 thru 13
L5	UHF IF Trap	0Ω	0Ω	RLI-181				
L6	VHF RF Coils	0Ω		RBX-064				UHF IF Coil-Channel 2-13
L7	VHF Mixer Grid Coils	0Ω		RBX-063				UHF IF Coil-Channel 2-13
L8	VHF Osc.Coils	0Ω		RBX-062				Channel 2 thru 13
L9	Conv. Plate	.1Ω		RLI-359				
L10	RF Choke	0Ω		RLI-366				.12 Microhenry
L11	47.25MC Trap	0Ω		RLI-355				Core part #RE1-067.
L12	1st Video IF	.1Ω		RLI-364		TV-131s		Core part #RE1-065.
L13	2nd Video IF	0Ω	0Ω	RTL-198				Includes 47.25MC Trap.
L14	3rd Video IF	.1Ω	1Ω	RTL-179	17-4634s	TV-130s	6319s	Core part #RE1-065.
L15	4th Video IF	.1Ω	1Ω	RTL-191			6319	Core part #RE1-067.
L16	Series Peaking Coil	8.3Ω		RLI-138	19-1005		4613	10 Microhenries; IRC part #CL-1.
L17	Series Peaking Coil	.8Ω		RLI-396	19-1001		4612	1 Microhenries
L18	Shunt Peaking Coil	9.5Ω		RLI-345	19-1400	TV-190	6134	220 Microhenries
L19	Series Peaking Coil	4.3Ω		RLI-305	19-1235		6176	130 Microhenries
L20	Series Peaking Coil			RLI-353				1.8 Microhenries; IRC part #CL-1.
L21A	4.5MC Trap	2.8Ω		RLI-343				
B	Sound IF	2.8Ω						
L23	Shunt Peaking Coil	10Ω		RLI-382	19-1500		6135	470 Microhenries
L23	Series Peaking Coil	10Ω		RLI-338	19-1300A	TV-190A	6132A	330 Microhenries; Wound on 1SK resistor
L24	Ratio Det.	6.6Ω	1.1KCT	RTD-023				Tertiary winding includes 2300 resistor.
L25	RF Choke	8.3Ω		RLI-138	19-1005		4613	10 Microhenries; IRC part #CL-1.

* Drill mounting hole.
a Parallel with 1SK resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI.	SEC.	General Electric PART No.	MEISSNER PART No.	MERIT PART No.	MULLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L26	30Ω		RLI-357		6314					Core part #RE1-064.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE @ CURRENT 1000 (~)	General Electric PART No.	Hallderson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
L27	.220A	58Ω	L.2H†	RLF-068	C5040	C-2994	C-2327	36C41		

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			General Electric PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG P/T S/B	3/8A 125V	REF-016		315. 375 (3AG-P/T-S/B-3/8A)		MDV 3/8	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		General Electric PART No.	SYLVANIA PART No.	
M2	1N87G*	RED-001	1N60	Video Det. (Pigtail)

* Some versions may use crystal diode type 1N64 in this application.

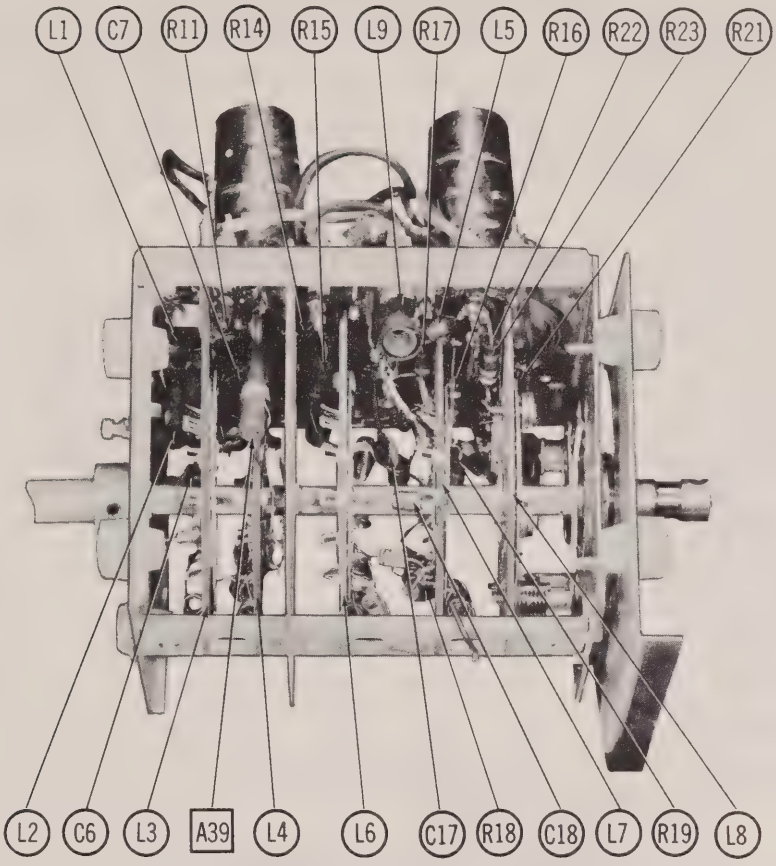
SELENIUM DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		General Electric PART No.	SYLVANIA PART No.	
M3		RER-023	1N34A †	Horiz. Phase Det. (Pigtail)

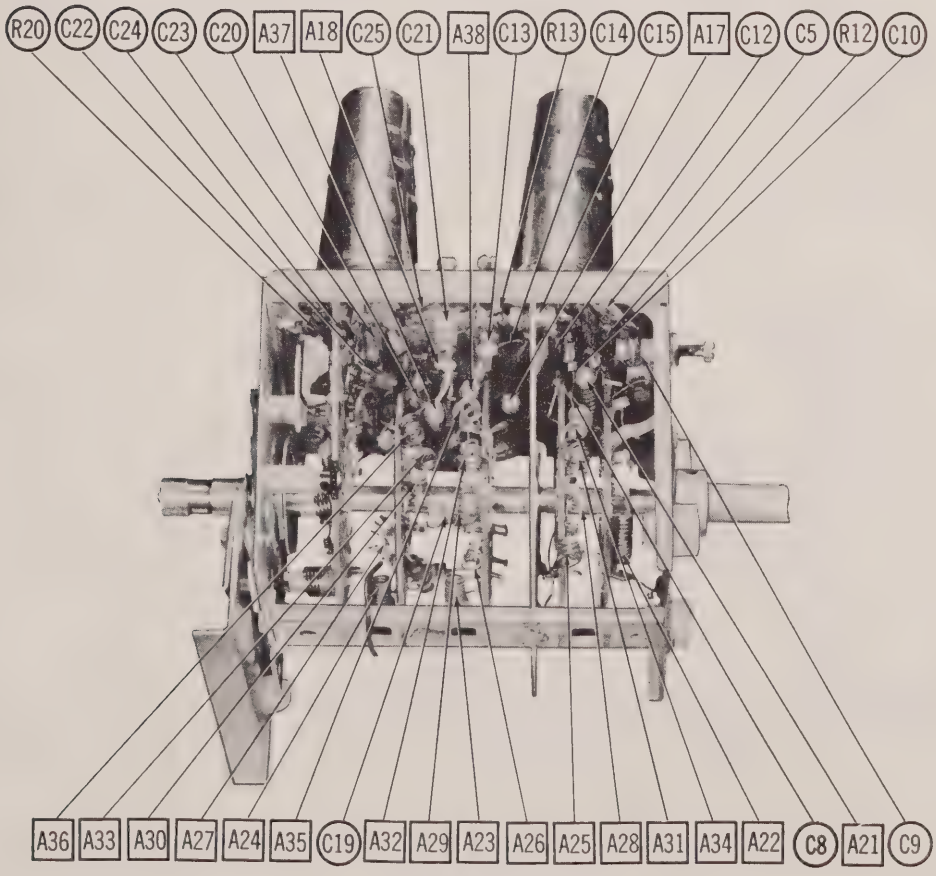
† 2 required.

MISCELLANEOUS

ITEM No.	PART NAME	General Electric PART No.	NOTES
M4	Tuner	RJX-083	VHF - Models 21C133, 21C134, 21C135, 21C136.
	Tuner	RJX-082	VHF - Models 21C141, 21C142.
M5	Tuner	RUX-015	UHF (VHF-UHF Models) Models 21C133, 21C134, 21C135, 21C136.
	Tuner	RUX-014	UHF (VHF-UHF Models) Models 21C141, 21C142.
M6	Switch	RSS-011	Local-Distant (DPDT-Slide Type)
M7	Switch	RSS-010	Width (SPST-Slide Type)
M8	Clock	RZC-059	Models 21C141, 21C142.
M9	Centering Device	REA-013	
M10	Ion Trap	RET-013	
	Flexible Shaft	RMU-144	For Contrast Control - Models 21C133, 21C134.
	Flexible Shaft	RMU-149	For Contrast Control - Models 21C141, 21C142.
	Flexible Shaft	RMU-150	For Contrast Control - Models 21C135, 21C136.
	Extension Shaft	RMU-145	For Channel Selector - Models 21C141, 21C142.
	Extension Shaft	RMU-146	Fine Tuning - Models 21C141, 21C142.
	Extension Shaft	RMU-147	UHF Indicator - Models 21C142, 21C141.
	Cabinet	RAV-1009	Model 21C141.
	Cabinet	RAV-1010	Model 21C135.
	Cabinet	RAV-1011	Model 21C136
	Cabinet	RAV-1012	Model 21C142.
	Cabinet	RAV-1013	Model 21C133.
	Cabinet	RAV-1014	Model 21C134.
	Knob	RDK-469	VHF Channel Selector - Model 21C141.
	Knob	RDK-559	VHF Channel Selector - Models 21C133, 21C135, 21C136.
	Knob	RDK-567	VHF Channel Selector - Model 21C142.
	Knob	RDK-572	VHF Channel Selector - Model 21C134.
	Knob	RDK-560	VHF-UHF Selector - Models 21C133, 21C135, 21C136.
	Knob	RDK-573	VHF-UHF Selector - Model 21C134.
	Knob	RDK-530	Fine Tuning - Models 21C141, 21C142.
	Knob	RDK-557	Contrast & Fine Tuning - Models 21C133, 21C135, 21C136.
	Knob	RDK-570	Contrast & Fine Tuning - Model 21C134.
	Knob	RDK-475	Contrast - Model 21C141.
	Knob	RDK-565	Contrast - Model 21C142.
	Knob	RDK-528	UHF Dial - Model 21C141.
	Knob	RDK-561	UHF Dial - Models 21C133, 21C135, 21C136.
	Knob	RDK-568	UHF Dial - Model 21C142.
	Knob	RDK-574	UHF Dial - Model 21C134.
	Knob	RZK-035	Metal (Clock) - Models 21C141, 21C142.
	Knob	RZK-036	Clear (Clock) - Models 21C141, 21C142.
	Knob	RDK-531	On-Off-Volume & Vertical Hold - Model 21C141.
	Knob	RDK-558	On-Off-Volume & Vertical Hold - Models 21C133, 21C135, 21C136.
	Knob	RDK-566	On-Off-Volume & Vertical Hold - Model 21C142.
	Knob	RDK-571	On-Off-Volume & Vertical Hold - Model 21C134.
	Knob	RDK-556	Brightness - Models 21C141, 21C142.
	Knob	RDK-562	Brightness - Models 21C133, 21C135, 21C136.
	Knob	RDK-575	Brightness - Model 21C134.
	Mask	RDM-071	Models 21C133, 21C134, 21C135, 21C141.
	Mask	RDM-072	Model 21C142.
	Mask	RDM-073	Model 21C136.
	Safety Glass	RDW-106	



RF TUNER-RIGHT SIDE

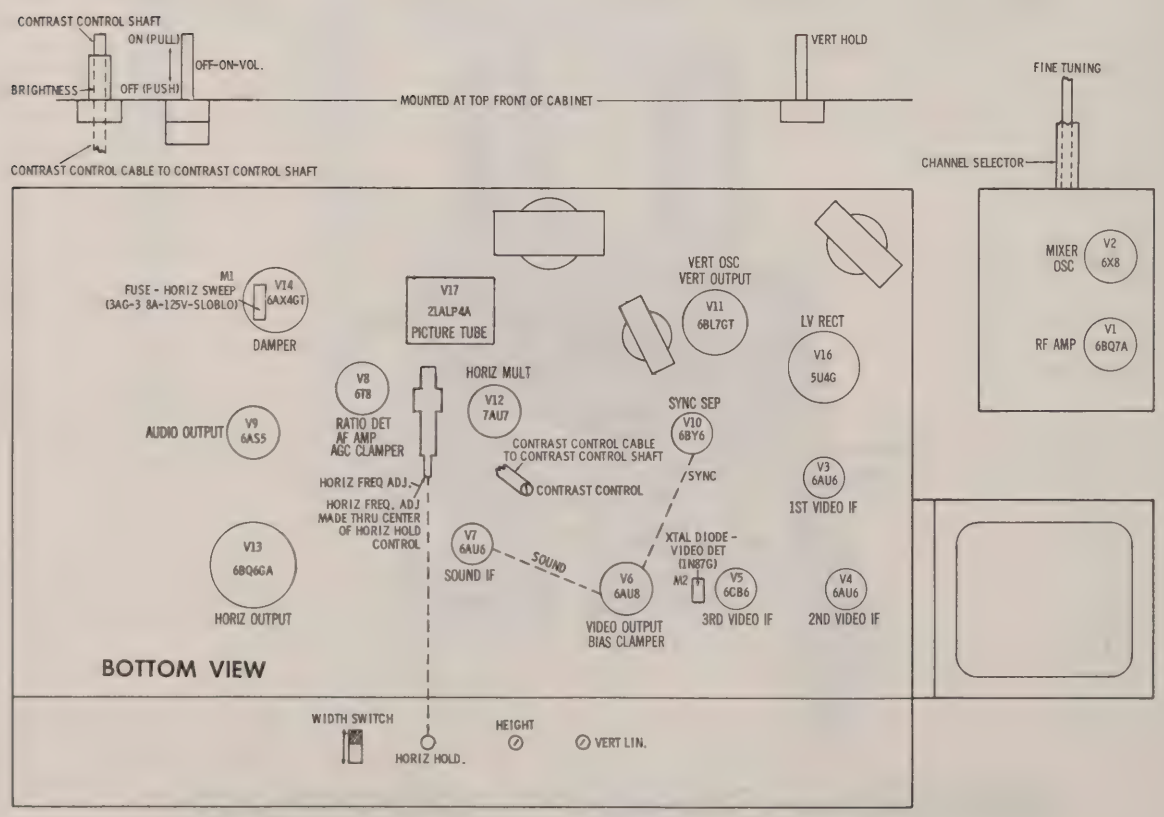


RF TUNER-LEFT SIDE

RESISTANCE MEASUREMENTS

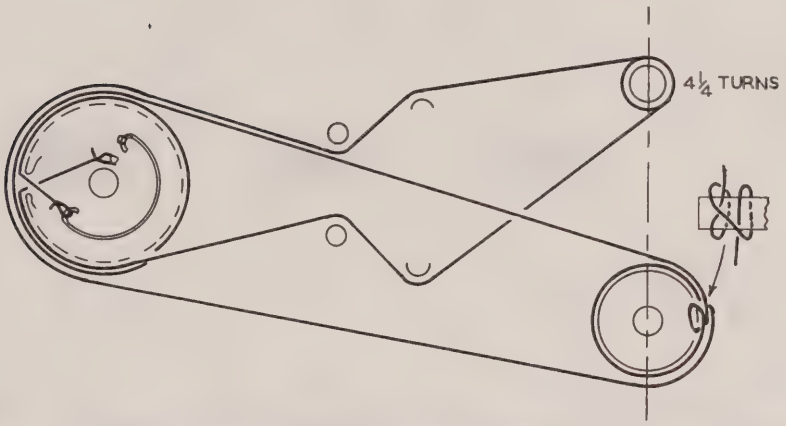
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BQ7A	†1300Ω	400K	INF	0Ω	.1Ω	INF	7Meg	100Ω	0Ω
V2	6X8	0Ω	10K	■ 4700Ω	0Ω	.1Ω	0Ω	160K	■ 4700Ω	■ .2Ω
V3	6AU6	2.2Meg	0Ω	.1Ω	0Ω	†520Ω	■ 1000Ω	47Ω		
V4	6AU6	2.2Meg	0Ω	.1Ω	0Ω	†520Ω	■ 1000Ω	56Ω		
V5	6CB6	.1Ω	180Ω	0Ω	.1Ω	†4700Ω	■ 1000Ω	0Ω		
V6	6AU8	0Ω	2.2Meg	†470K	0Ω	.1Ω	100Ω	1Meg	40K	†3700Ω
V7	6AU6	68K	0Ω	0Ω	.1Ω	■3300Ω	■ 3300Ω	330Ω		
V8	6T8	INF	22K	INF	0Ω	.1Ω	4Meg	0Ω	3.3Meg	†470K
V9	6AS5	40K	300K	0Ω	.1Ω	300K	†12K	†750Ω		
V10	6BY6	†1.5Meg	0Ω	0Ω	.1Ω	†35K	■15K	3Meg		
V11	6BL7GT	2.2Meg	▲4000Ω	● 1800Ω	● 1Meg	▲● 2.2Meg	175Ω	0Ω	.1Ω	
V12	7AU7	†12K	1.5Meg	1200Ω	0Ω	.1Ω	†82K	50K	1200Ω	.8Ω
V13	6BQ6GA	TP	.1Ω	TP	§†18K	1Meg	TP	0Ω	0Ω	TOP CAP ▲30Ω
V14	6AX4GT	TP	NC	200K	NC	†58Ω	NC	0Ω	.1Ω	
V15	1B3GT		PINS	1 - 8	HAVE	INFINITE	RESISTANCE			TOP CAP ▲420Ω
V16	5U4GA	NC	30K	NC	49Ω	NC	46Ω	NC	30K	
V17	21ALP4A	0Ω	33K	Pin 6 ▲350K	Pin 10 ▲350K	Pin 11 ■● 300K	Pin 12 .1Ω			

† MEASURED FROM PIN 2 OF V16.
■ MEASURED FROM 135V LINE.
▲ MEASURED FROM PIN 3 OF V14.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
§ MEASURED WITH WIDTH SWITCH IN OPEN POSITION.
NC NO CONNECTION
TP TIE POINT



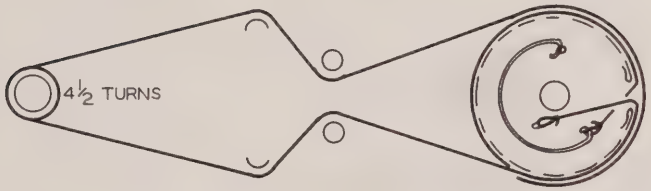
TUBE PLACEMENT CHART

UHF PULLEY AT MAX. COUNTER CLOCKWISE POSITION AND
WITH SMALL DRIVE PULLEY PLASTIC SLEEVE TAB AT 3 O'CLOCK.



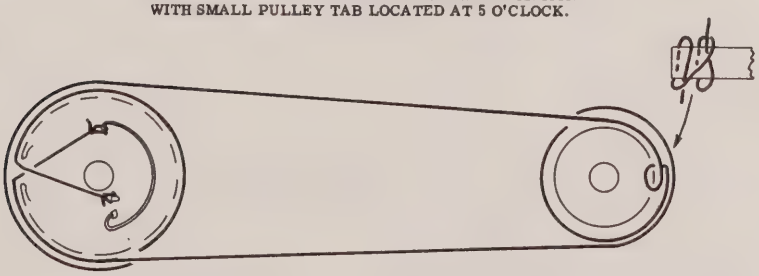
UHF DIAL STRINGING (USED WITH VHF TUNER RJX-082)

UHF PULLEY MAX. CLOCKWISE



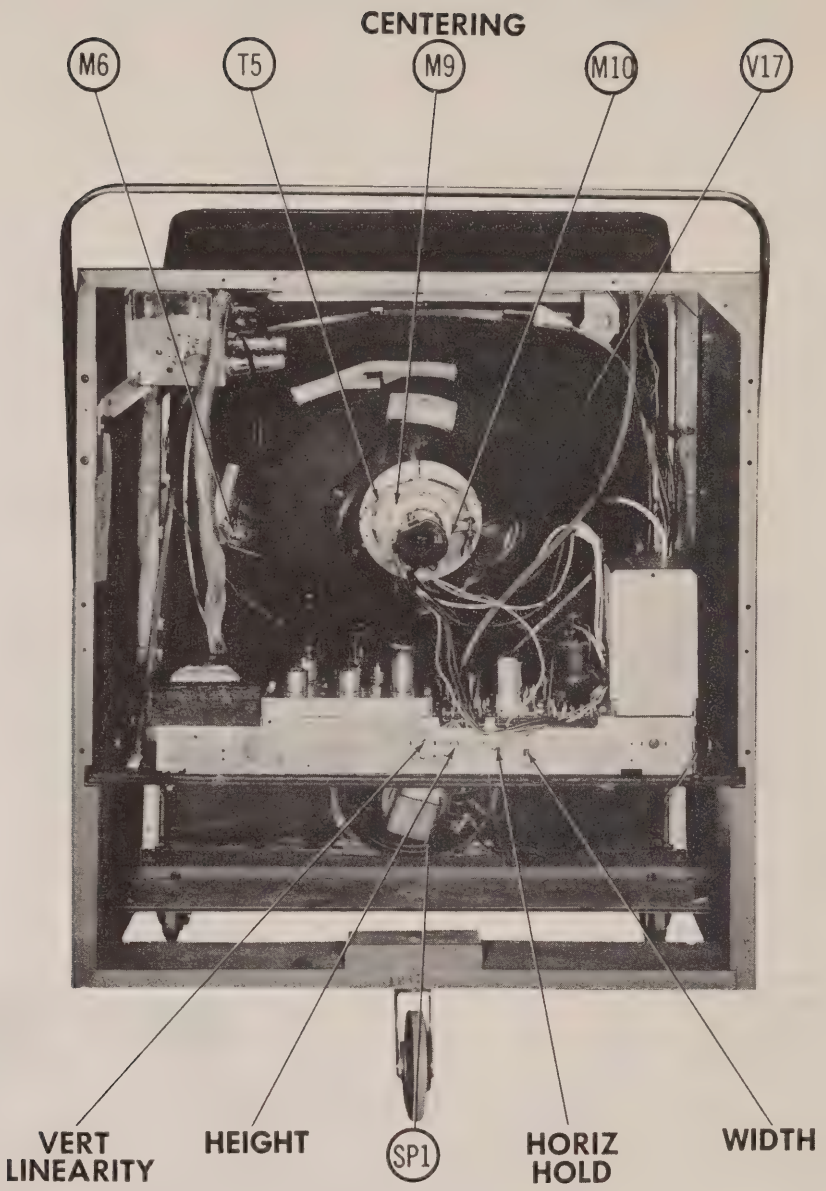
"REAR" UHF DIAL STRINGING (USED WITH VHF TUNER RJX-083)

UHF PULLEY FULLY COUNTER CLOCKWISE POSITION
WITH SMALL PULLEY TAB LOCATED AT 5 O'CLOCK.



"FRONT" UHF DIAL STRINGING (USED WITH VHF TUNER RJX-083)

UHF DRIVE CORD STRINGING



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Short TS4-10 to chassis with a clip lead. Shunt the horizontal stabilizer coil (L26) with a 1000Ω resistor.
2. Adjust the horizontal hold control (R5) so that the picture floats back and forth thru synced position.
3. Remove the 1000Ω shunt from across L26. Adjust horizontal stabilizer slug (B1) so that the picture again floats back and forth as in step 2.
4. Remove the short from TS4-10. Check the horizontal pull-in on normal signal and readjust the horizontal hold contrc' if necessary.
5. If width is insufficient, reposition width switch (M7).

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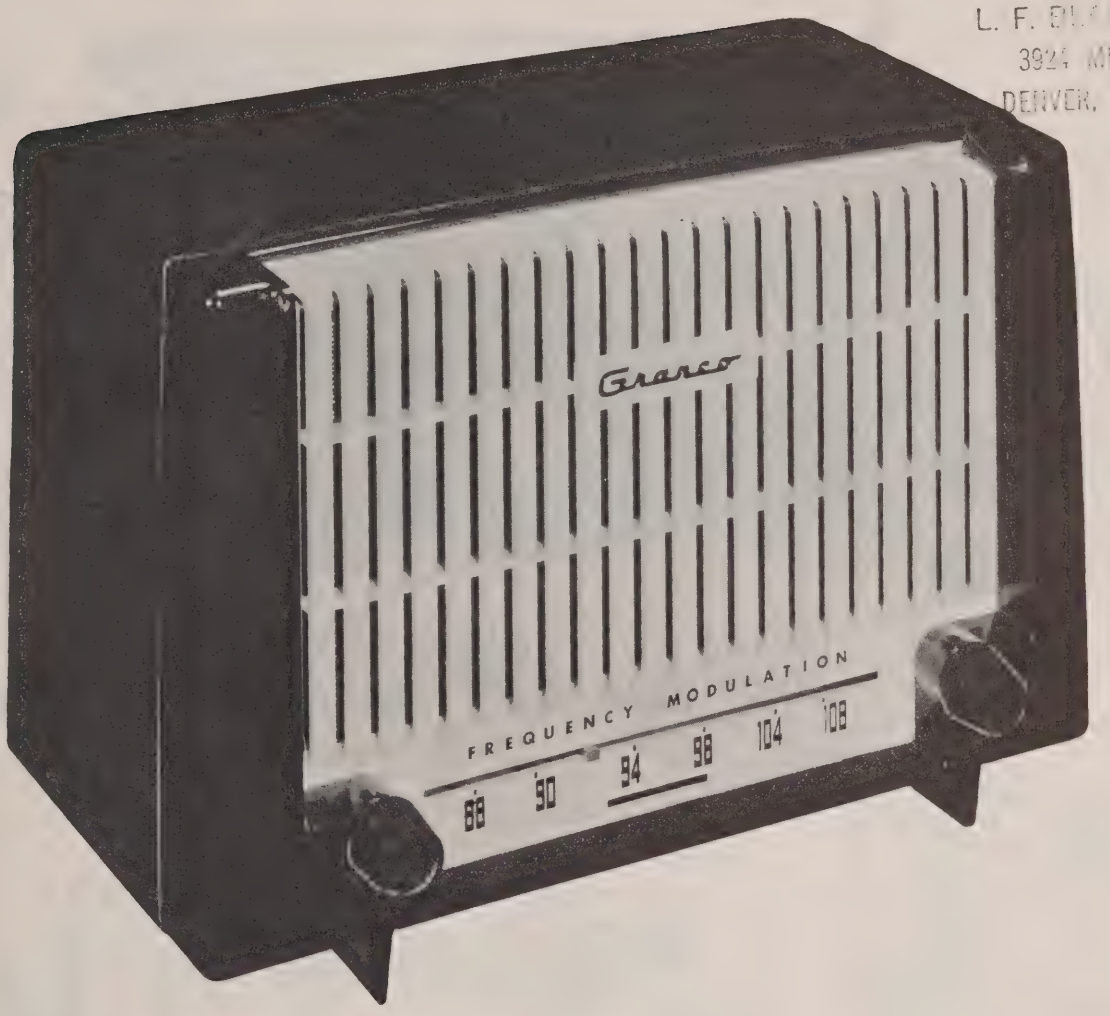
L. F. BLANKENSHIP
3924 MYRTLE ST.
DENVER, COLORADO

GRANCO
MODEL 620V



GRANCO
MODEL 620V

TRADE NAME	Granco Model 620V
MANUFACTURER	Granco Products, Inc., 36-17 20th. Ave., Long Island City 5, N.Y.
TYPE SET	AC-DC Operated FM Superheterodyne Receiver
TUBES (Six)	Types 12BA6 RF Amplifier, 12AT7 Mixer-Oscillator, 12BA6 1st. IF Amplifier, 12BA6 2nd. IF Amplifier, 19T8 Ratio Detector-AF Amplifier, 50C5 Output
POWER SUPPLY	105-120 Volts AC-DC RATING .33 Amp. @ 117 Volts AC
TUNING RANGE—	FM 88MC-108MC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BA6	
V2	Mixer-Oscillator	12AT7	
V3	1st. IF Amplifier	12BA6	
V4	2nd. IF Amplifier	12BA6	
V5	Ratio Det.-AF Amplifier	19T8	
V6	Output	50C5	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA GRANCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■80	150	AC628	AFH3-11	CO10	FP311.65	TMT-12	T-050	R2302 *
B	50	150				TC47		MT-1530	
C	▲50	150							
C2	2	50		PRS50V2	BBR2-50	TC302	TD-2-50	MT-0502	TVA-1301

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

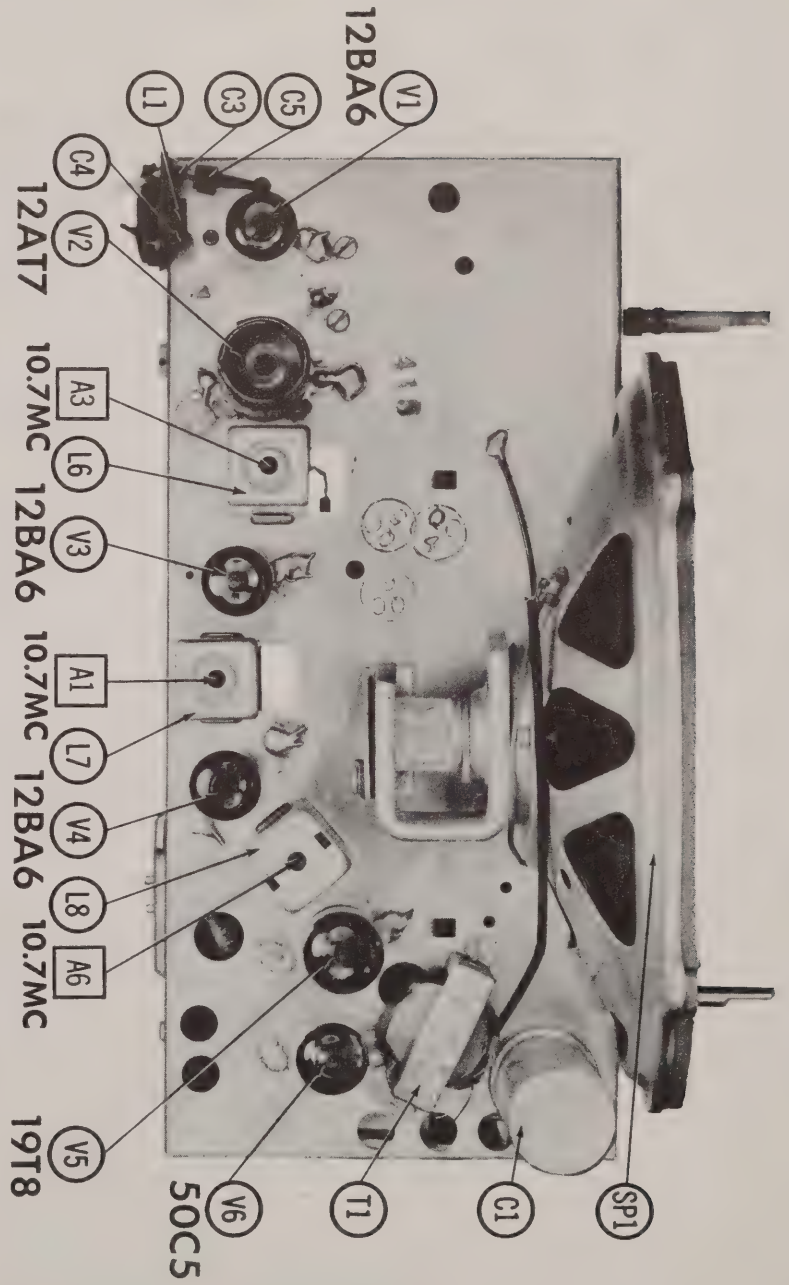
ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA GRANCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	10			NP0-S110	TCZ-10	TZ09	NP0A-100	ZT-541	5TCC-T1	
C4	50			NP0-S150	TCZ-50	Z034	NP0-338-500	ZT-545	5TCC-Q5	
C5	50			NP0-S150	TCZ-50	Z034	NP0-338-500	ZT-545	5TCC-Q5	
C6	50			NP0-S150	TCZ-50	Z034	NP0-338-500	ZT-545	5TCC-Q5	
C7	.27									
C8	80									
C9	8.5									
C10	2000			BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	
C11	2000									
C12	2000			BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	
C13	2000			BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	
C14	4000			BPD-004	D6-402	K078	811-004	UC-5240	5HK-D4	
C15	2000			BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	
C16	2000			BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	
C17	100			BPD-0001	DD-101	G042	801-101	UC-531	5GA-T1	
C18	2000			BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	
C19	6.8			NP0-D16.8	TCZ-6R8	Z013	NP0A-6R8	ZT-5568	5TCCB-V68	
C20	2000			BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	
C21	2000			BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	Note 1
C22	4000			BPD-004	D6-402	K078	811-004	UC-5240	5HK-D4	
C23	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C24	4000			BPD-004	D6-402	K078	811-004	UC-5240	5HK-D4	
C25	2000									
C26	2000									
C27	2000			BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	
C28	2000			BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	

Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA GRANCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	A0-627-A	B-69-S	A47-1Meg-S	Q11-137	U54	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	Not Req.	SWE-12	76-1	US-26	Attach to R1A

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	GRANCO PART No.	IRC PART No.	
R2	470K			BTS-470K	
R3	10K			BTS-10K	
R4	2200Ω			BTS-2200	
R5	330Ω			BTS-330	
R6	220K			BTS-220K	
R7	330Ω			BTS-330	
R8	100K			BTS-100K	
R9	330Ω			BTS-330	
R10	33K			BTS-33K	
R11	1Meg			BTS-1Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	GRANCO PART No.	IRC PART No.	
R12	22K			BTS-22K	
R13	4.7Meg			BTS-4.7Meg	
R14	220K			BTS-220K	
R15	330Ω	1		BTA-330	
R16	560Ω	7			
R17	22Ω	2		BW2-22	
R18	470Ω	1		BTA-470	
R19	10Ω			BTS-10	
R20	470K			BTS-470K	
R21	150Ω			BTS-150	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	GRANCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2500Ω	3-4Ω		Z1101	A-3025	A-3332	26S58	S-12X	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	GRANCO PART No.	QUAM PART No.	RCA TYPE No.	
SP1	5" x 7"	PM	3-4Ω	CZ-620	57A1	257S1	

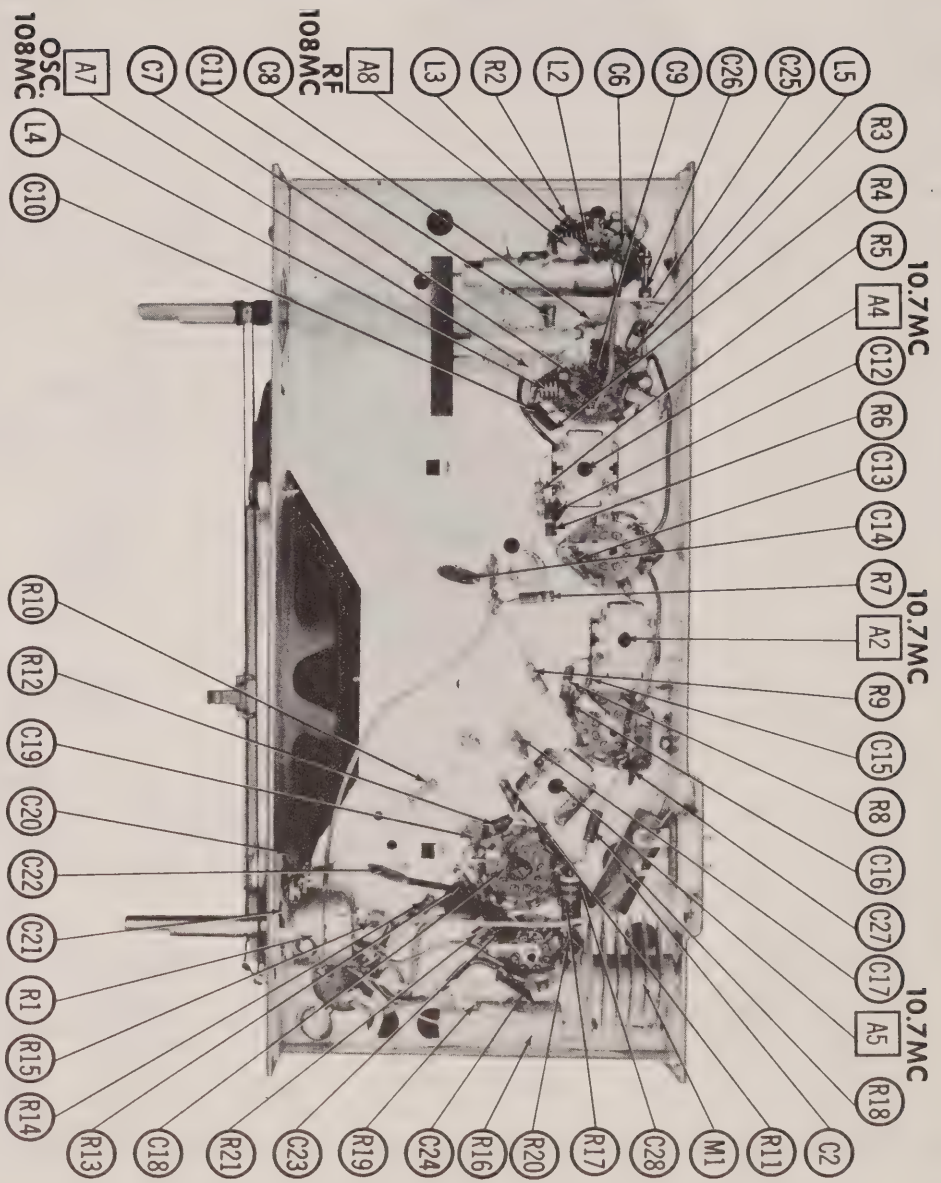
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	GRANCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	FM Ant. Coil	0Ω		AL477				
L2	RF Choke	.3Ω		AL141	19-1002		4606	2.9 Microhenries
L3	FM RF Coil	0Ω		AL455				
L4	FM Osc. Coil	0Ω		AL456				
L5	Cathode Choke	.3Ω		AL141	19-1002		4606	2.9 Microhenries
L6	1st. FM IF	1Ω	1Ω	CL472	16-3487	FM-254	1463	
L7	2nd. FM IF	1Ω	1Ω	CL472	16-3487	FM-254	1463	
L8	Ratio Det.	1.6Ω	1ΩCT	CL473	17-3498	FM-255	1465	Tertiary winding-.5Ω

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	GRANCO PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.081A	H-100A	1004A	RS100A	6S100	5M4	100A	

CHASSIS—BOTTOM VIEW



ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 12AT7 (V2). Low side to chassis.	10.7MC (Unmod)	Point of non-interference	DC probe to point (A). Common to chassis.	A1, A2, A3, A4, A5	Adjust for maximum deflection.
2.	"	"	"	"	DC probe to point (B). Common to chassis.	A6	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 12AT7 (V2). Low side to chassis.	10.7MC (450KC Swp)	Point of non-interference	Vert. Amp. to point (A). Low side to chassis.	A1, A2, A3, A4, A5	Disconnect stabilizing capacitor C2. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
2.	"	"	"	"	Vert. Amp. to point (B). Low side to chassis.	A6	Reconnect stabilizing capacitor C2. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A5 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
3.	Two 39Ω Carbon Resistors	Across antenna lead with 39Ω in each lead.	108MC	108MC (tuning slugs out)	DC probe to point (A). Common to chassis.	A7, A8	Adjust for maximum deflection.
4.	"	"	88MC	88MC (tuning slugs in)	"	L3, L4	Adjust for maximum deflection by expanding or compressing coil turns.

FIG. 1

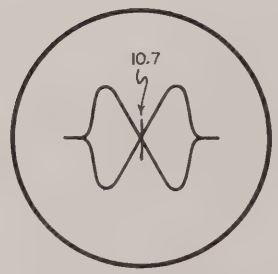
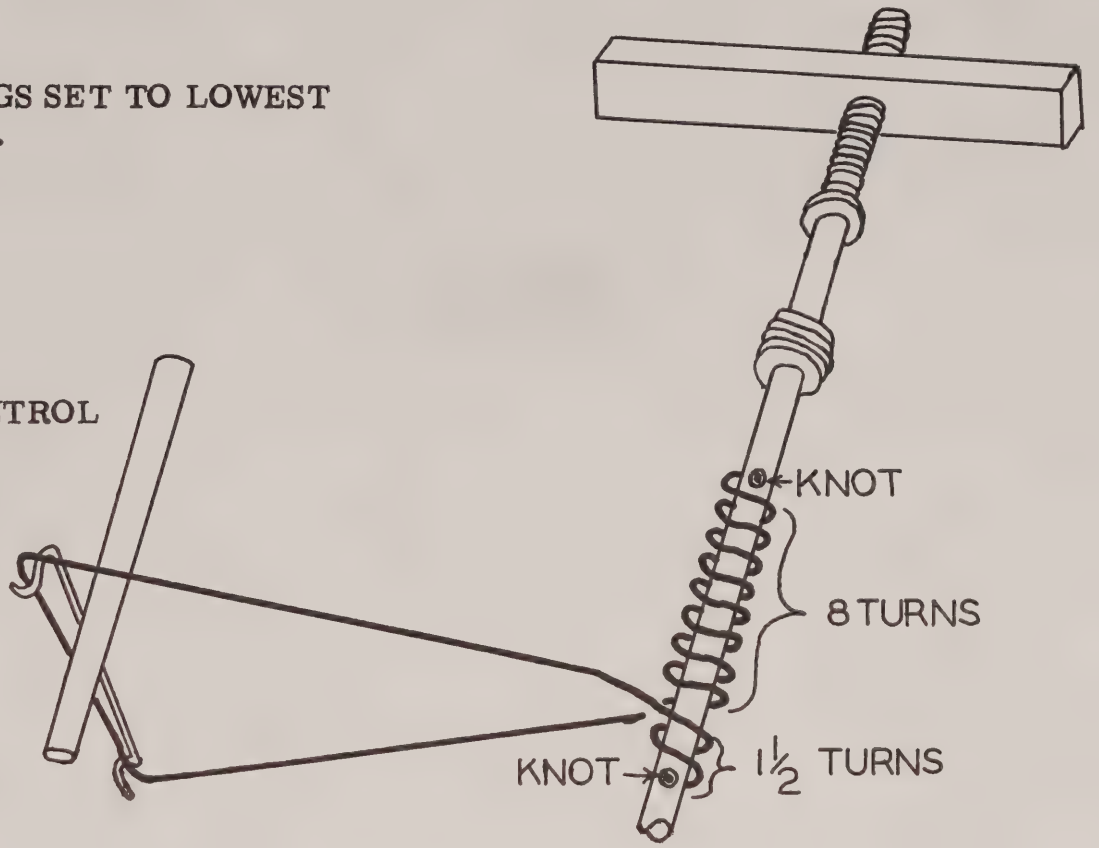


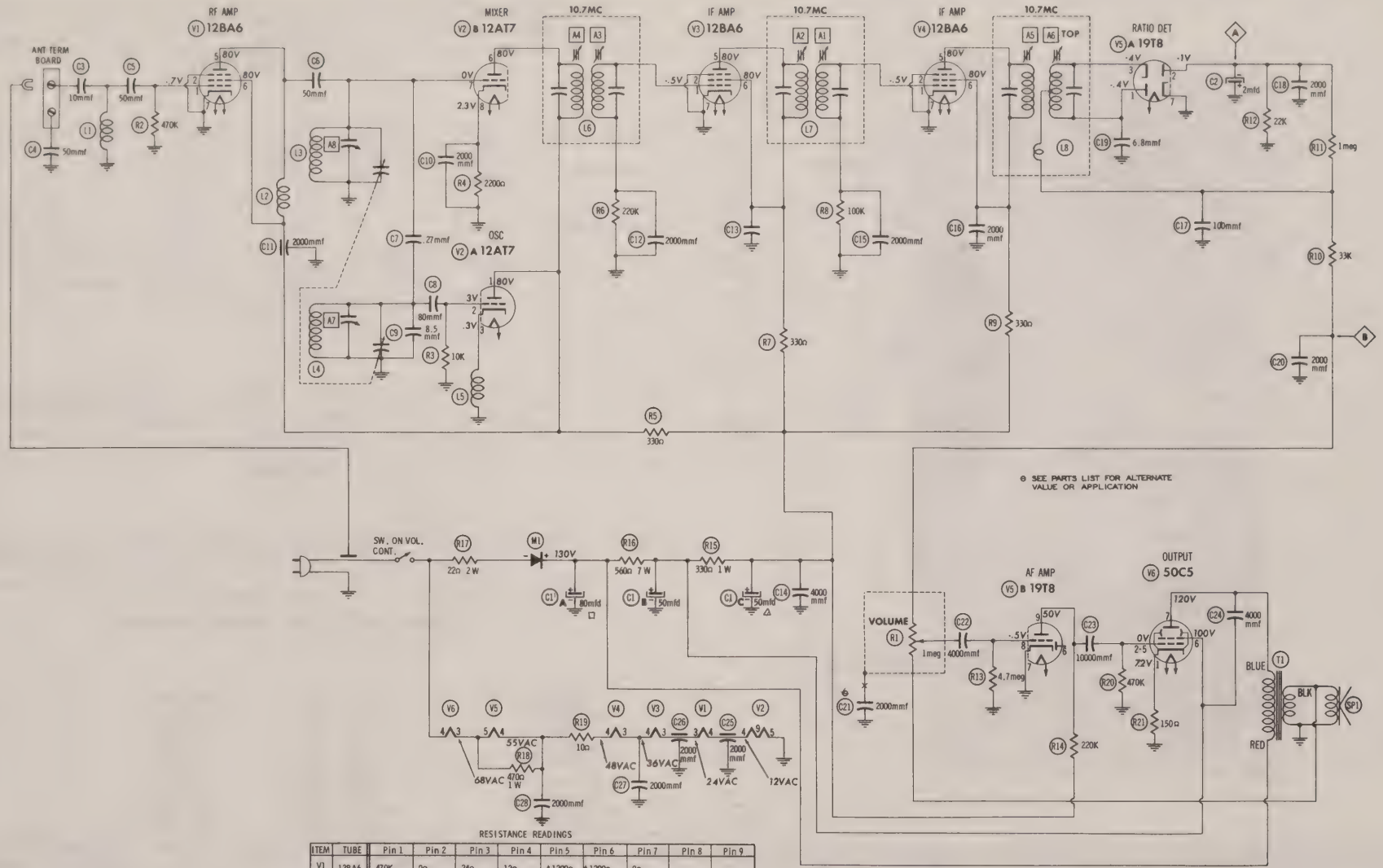
FIG. 2

TUNING SLUGS SET TO LOWEST FREQUENCY.



DIAL CORD DRIVE

PROPERTY OF
L. F. P[illegible]ARKENSHIP
39[illegible] ST.
DENVER, COLORADO



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BA6	470K	0Ω	24Ω	12Ω	†1200Ω	†1200Ω	0Ω		
V2	12AT7	†1200Ω	10K	.3Ω	12Ω	0Ω	†1200Ω	0Ω	2200Ω	NC
V3	12BA6	220K	0Ω	24Ω	36Ω	†1200Ω	†1200Ω	0Ω		
V4	12BA6	100K	0Ω	36Ω	48Ω	†1200Ω	†1200Ω	0Ω		
V5	19T8	570K	22K	570K	65Ω	82Ω	NC	0Ω	4.7Meg	†220K
V6	50C5	150Ω	470K	82Ω	132Ω	470K	†560Ω	†180Ω		

† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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RETMA MEMBER

HARMAN-KARDON MODEL D200

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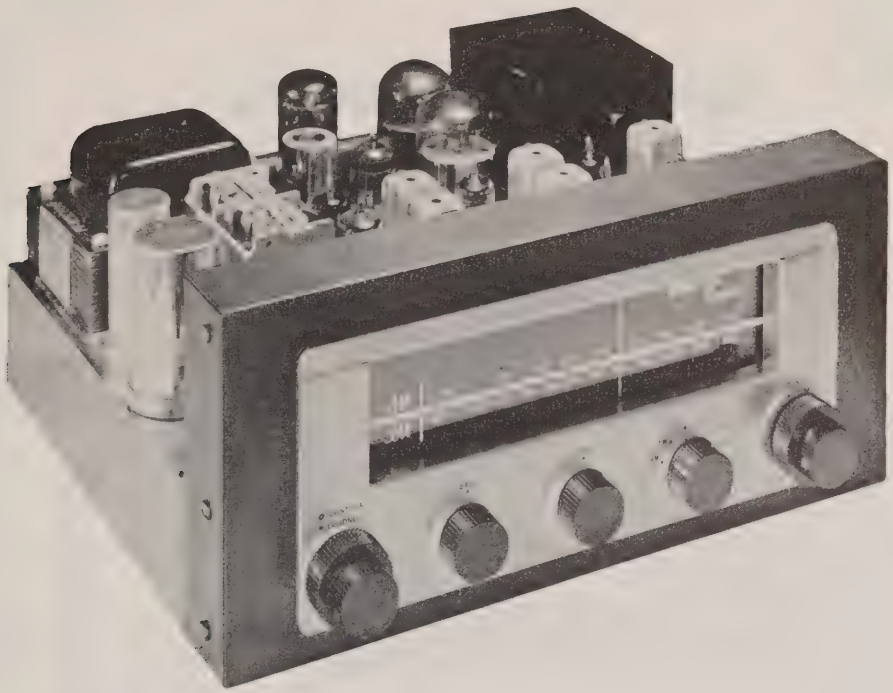
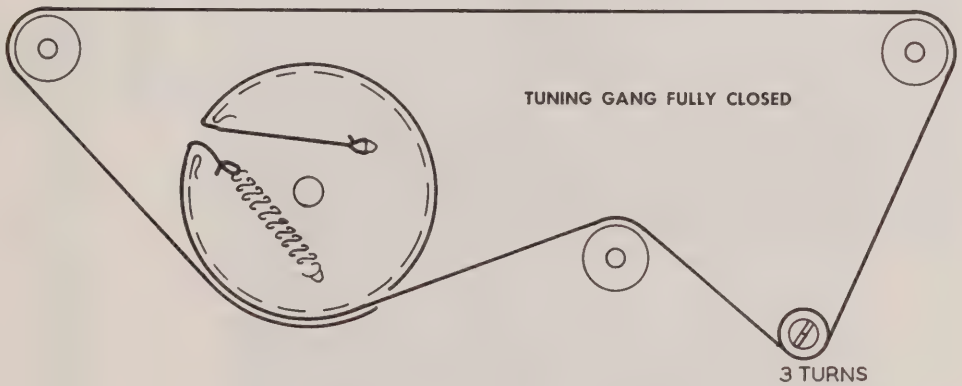
3324 MEADE ST.
DENVER, COLORADO

HARMAN-KARDON
MODEL D200



HARMAN-KARDON
MODEL D200

TRADE NAME	Harman-Kardon Model D200
MANUFACTURER	Harman-Kardon, Inc., 520 Main St., Westbury L.I., N.Y.
TYPE SET	AC Operated FM-AM Superheterodyne Receiver
TUBES	Thirteen
POWER SUPPLY	105-125 Volts AC - 60 Cycles RATING .82 Amp. @ 117 Volts AC
TUNING RANGE--BROADCAST	530KC - 1650KC FM 88MC - 108MC



DIAL CORD STRINGING

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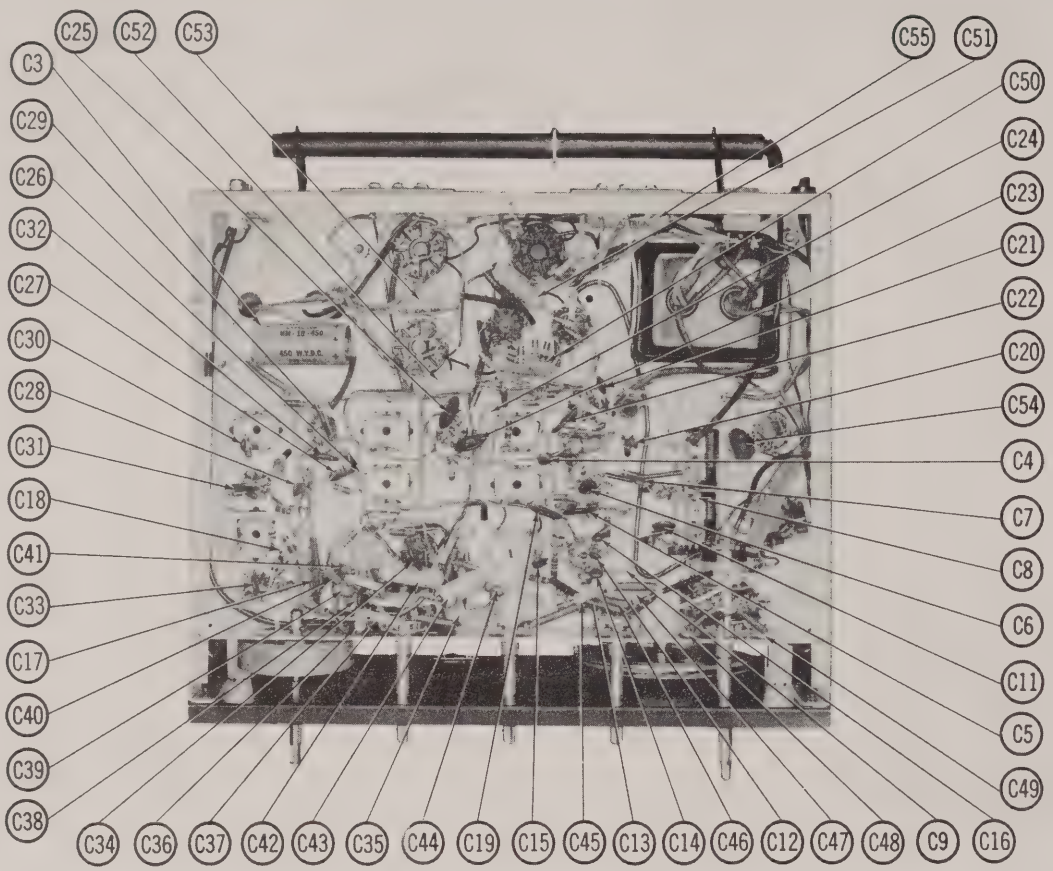
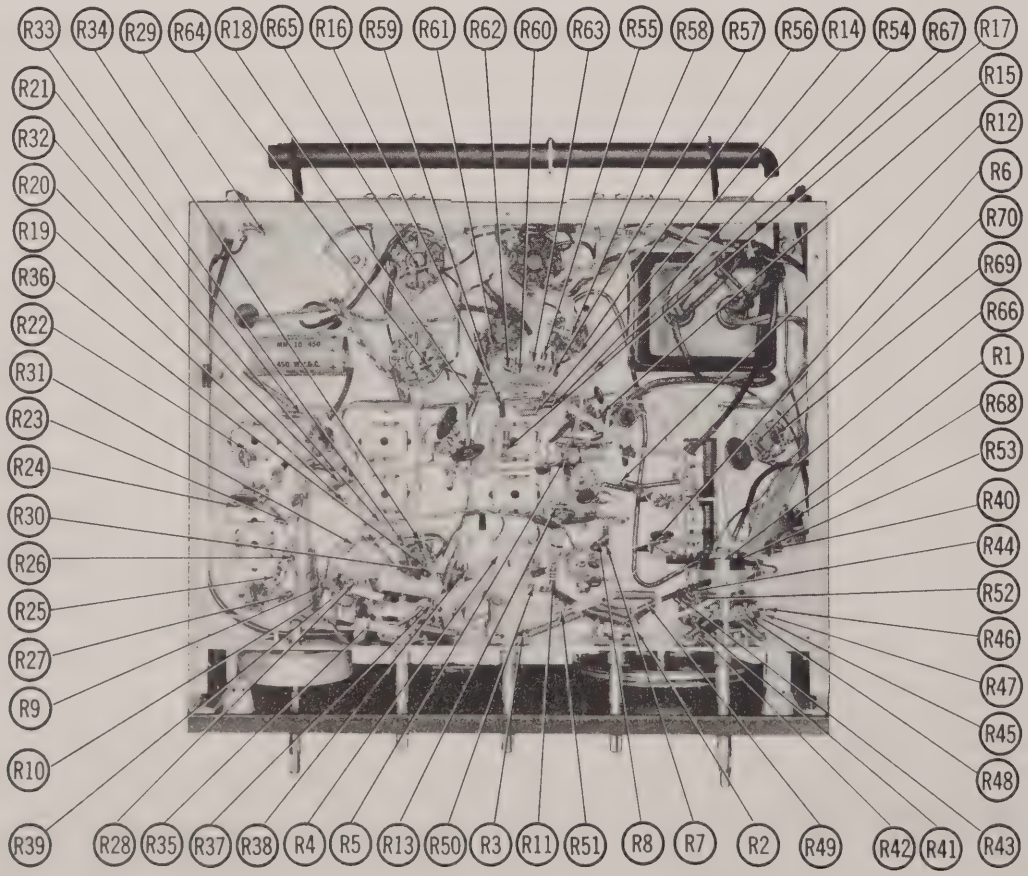
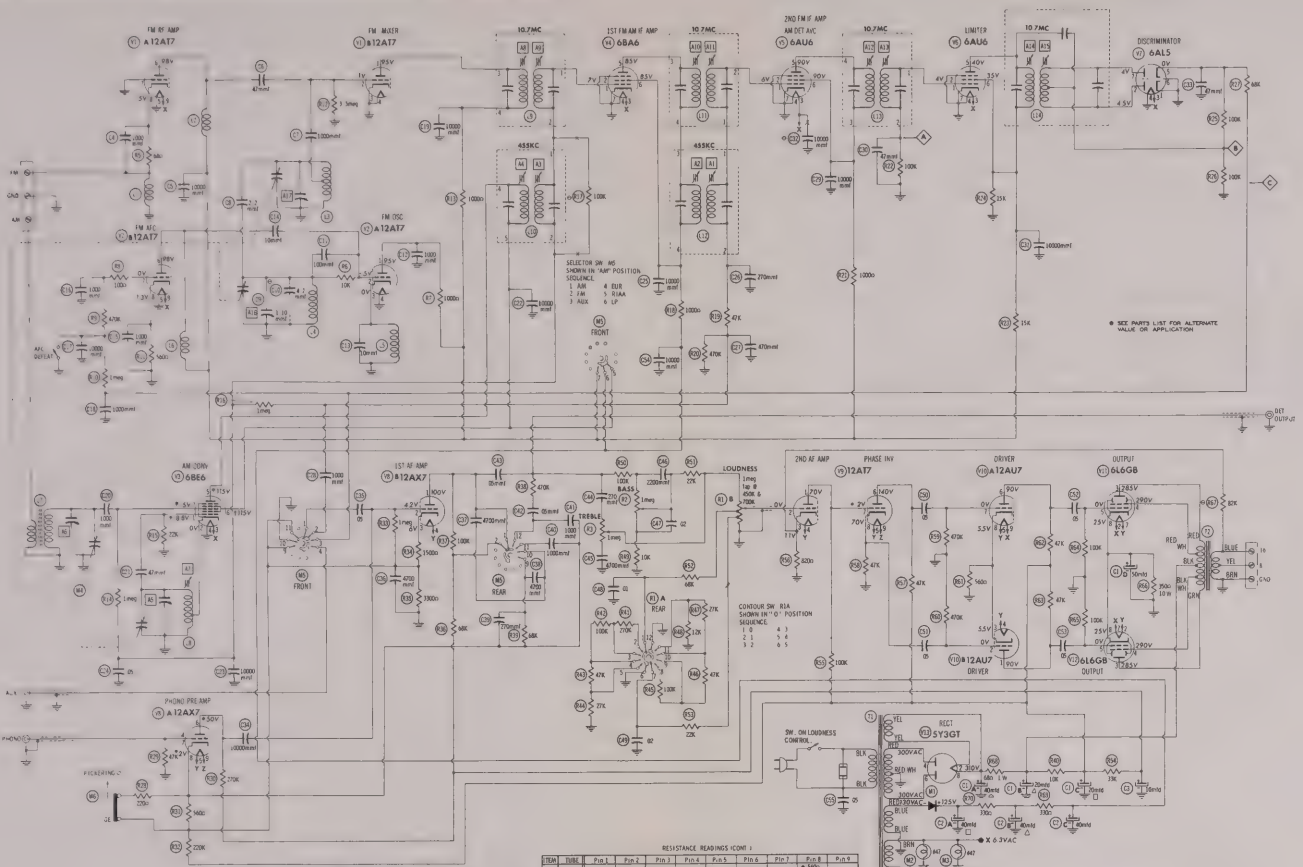


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AT7	†-1700Ω	3.3Meg	0Ω	0Ω	0Ω	†660Ω	0Ω	68Ω	0Ω
V2	12AT7	†1700Ω	10K	60Ω	0Ω	0Ω	†660Ω	1.7Meg	560Ω	0Ω
V3	6BE6	22K	4Ω	1Ω	0Ω	0Ω	†9MΩ	††660Ω	2.5Meg	
V4	6BA6	1.5Meg	0Ω	1Ω	0Ω	0Ω	†1200Ω	†1200Ω	0Ω	
V5	6AU6	520K	0Ω	1Ω	0Ω	0Ω	†1700Ω	†1700Ω	0Ω	
V6	6AU6	100K	0Ω	1Ω	0Ω	0Ω	510K	†15K	0Ω	
V7	6AL5	0Ω	100K	1Ω	0Ω	0Ω	220K	0Ω	100K	

RESISTANCE READINGS (CONT.)

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V8	12AX7	†† 110K	1Meg	480Ω	7Ω	7Ω	†† 305K	47K	♦ 560Ω 360Ω	7Ω
V9	12AT7	†† 110K	340K	820Ω	7Ω	7Ω	†† 57K	†† 110K	47K	7Ω
V10	12AU7	†† 57K	470K	560Ω	7Ω	7Ω	†† 57K	470K	560Ω	7Ω
V11	6L6GB	TP	7Ω	†† 220Ω	†† 90Ω	100K	TP	7Ω	350Ω	
V12	6L6GB	TP	7Ω	†† 195Ω	†† 85Ω	100K	TP	7Ω	350Ω	
V13	5Y3GT	TP	10K	NC	170Ω	†† 170Ω	100Ω	TP	10K	

ALL MEASUREMENTS TAKEN IN FM POSITION UNLESS OTHERWISE DESIGNATED.
† MEASURED IN "AM" POSITION. ♦ MEASURED IN "EUR" POSITION.
†† MEASURED FROM OUTPUT OF M5. * MEASURED FROM PIN 8 OF V9.
TP TIE POINT
NC NO CONNECTION

1 DC voltage measurements taken with vacuum tube voltmeter.
2 AC voltages measured at 1000 ohms per volt.
3 Normal line-cord and antenna hookup used.
4 Measurements are from chassis with gain control maximum.
5 Line voltage maintained at 117 volts for voltage readings.
6 Voltage readings may vary ±10% because of tolerance possible in variation of ±10% in voltage and line-resistance readings.
7 Volume control maximum. No signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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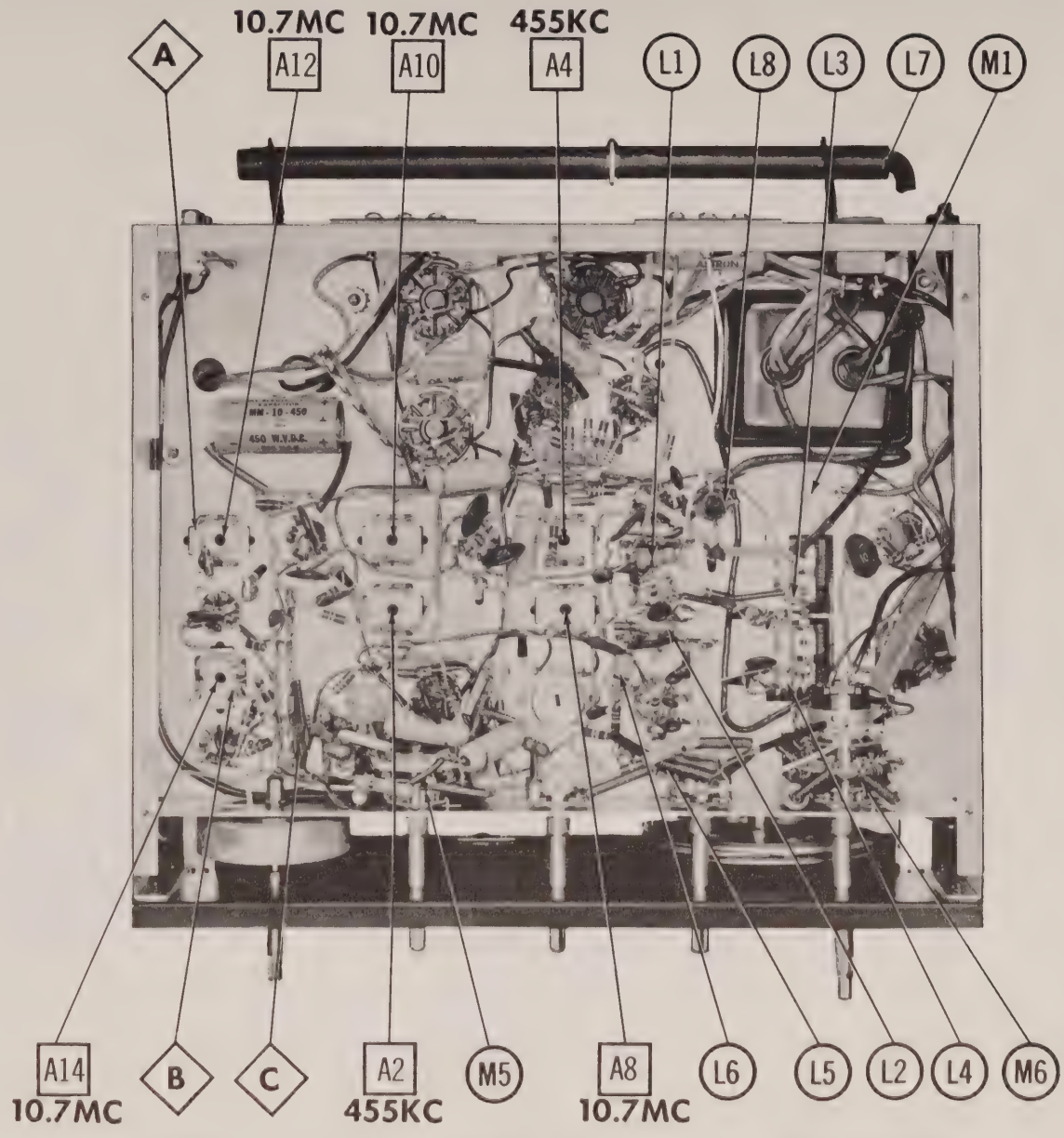


CHASSIS BOTTOM VIEW INDUCTOR AND ALIGNMENT IDENTIFICATION

PROPERTY OF
[illegible] PINK-FINISHED
[illegible] MAPLE ST.
DENVER, COLORADO

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to pin 7(grid) of 6BE6 (V3). Low side to chassis.	455KC (400∿ Mod)	AM	Tuning gang fully open.	Across output terminals.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	200MMF	Across AM antenna terminals.	1500KC	"	1500KC	"	A5, A6	"
3.	"	"	600KC	"	600KC	"	A7	Adjust for maximum deflection while rocking tuning gang.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to pin 2 (grid) of 12AT7 (V2). Low side to chassis.	10.7MC (unmod)	FM	Point of non-interference.	DC probe thru 100K to point Ⓐ. Common to chassis.	A8, A9, A10, A11, A12, A13	Adjust for maximum deflection.
5.	"	"	"	"	"	DC probe thru 100K to point Ⓑ. Common to chassis.	A14	"
6.	"	"	"	"	"	DC probe thru 100K to point Ⓒ. Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to pin 2 (grid) of 12AT7 (V2). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference.	Vert. amp. to point Ⓐ. Low side to chassis.	A8, A9, A10, A11, A12, A13	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
5.	"	"	"	"	"	Vert. amp. to point Ⓑ. Low side to chassis.	A14	"
6.	"	"	"	"	"	Vert. amp. to point Ⓒ. Low side to chassis.	A15	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A14 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	270Ω carbon resistor	High side thru 270Ω to FM antenna terminal. Low side to chassis.	106MC	FM	106MC	DC probe thru 100K to point Ⓐ. Common to chassis.	A15, A16	Adjust for maximum deflection.

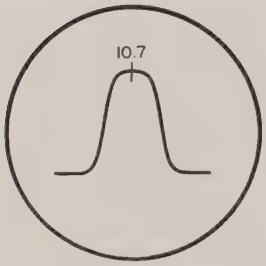


FIG. 1

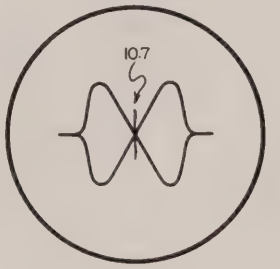


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amp. -FM Mixer	12AT7	
V2	FM Osc. -FM AFC	12AT7	
V3	AM Converter	6BE6	
V4	1st IF Amplifier	6BA6	
V5	2nd FM IF Amplifier-AM Detector-AVC	6AU6	
V6	Limiter	6AU6	
V7	Discriminator	6AL5	
V8	Phono Preamp. -AF Amp.	12AX7	
V9	AF Amp. -Phase Inv.	12AT7	
V10	Driver	12AU7	
V11	Output	6L6GB	
V12	Output	6L6GB	
V13	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Harman-Kardon PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	350	JE25911	AFH4-51	D044	FP419. 87	TMQ-56	Q-210	R2231*
B	■20	350							
C	▲20	350							
D	50	25							
C2A	■40	150	JE20635	AFH3-10	C009	FP212 / TC48	TMT-9	D-060 / FM-1540	
B	▲40	150							
C	40	150							
C3	10	450		PRS450V10	BR1045	TC72	TD-10-450	FM-4510	TVA-1705

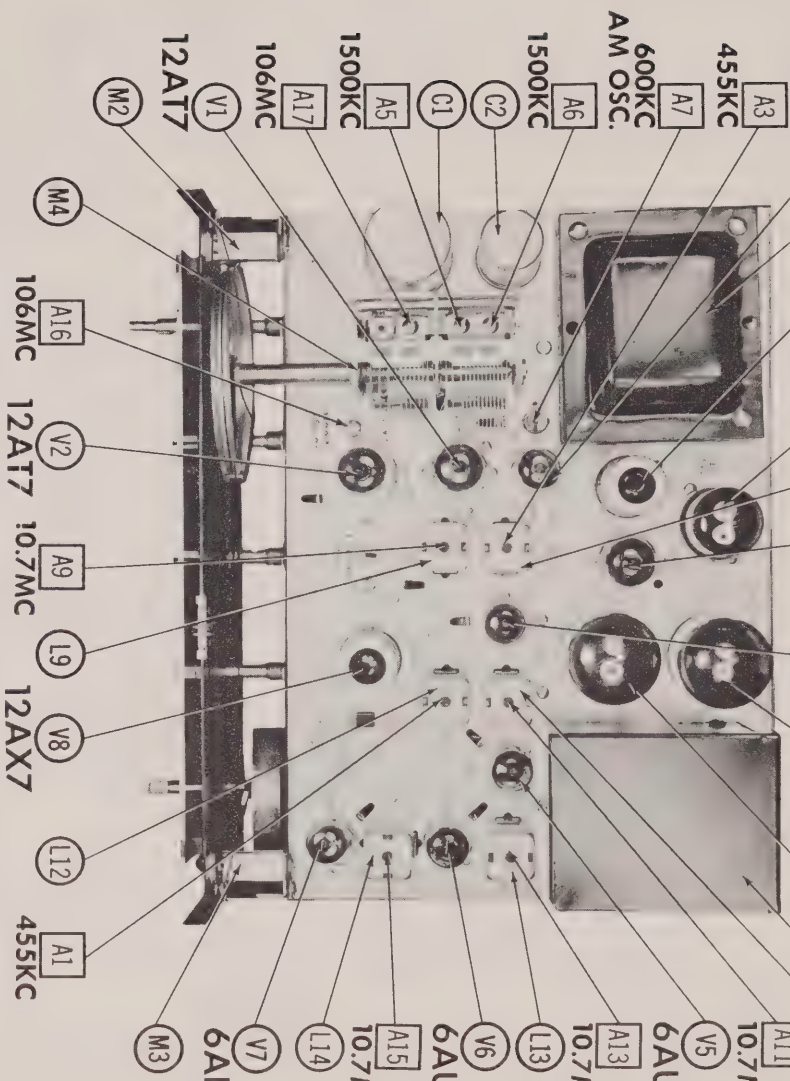
* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Harman-Kardon PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C5	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C6	47			N750-DI47	TCN-47	N033	N750K-470	NT-5447	5TCU-Q47	
C7	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C8	2. 2			NP0-SI2. 2	TCZ-2R2	Z006	NP0A-2R2		5TCCB-V22	
C9	1-10									
C10	4. 7			NP0-SI4. 7	TCZ-4R7	Z010	NP0A-4R7	ZT-5547	5TCCB-V47	Note 1
C11	100			N750-DI100	TCN-100	N042	N750L-101	NT-531	5TCU-T1	
C12	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C13	10			N750-DI10	TCN-10	N018	N750A-100	NT-541	5TCU-Q1	
C14	10			N750-DI10	TCN-10	N018	N750A-100	NT-541	5TCU-Q1	
C15	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C16	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C17	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C18	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C19	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C20	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C21	47			NP0-DI47	TCN-47	N033	N750K-470	NT-5447	5TCU-Q47	
C22	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C23	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C24	. 05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C25	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C26	270			SI270	D6-271	TP41	GP2K-271	UC-5327	5GA-T27	
C27	470			BPD-00047	DD-471	K060	GP2K-471	UC-5347	5GA-T47	
C28	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C29	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C30	47			BPD-000047	DD-470	G033	831-470	UC-5447	5GA-Q47	
C31	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C32	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	Note 1
C33	47			N750-DI47	TCN-47	N033	N750K-470	NT-5447	5TCU-Q47	
C34	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C35	. 05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C36	4700			SI4700	D6-472	TP63	GP2-333-472	UC-5247	5GA-D47	
C37	4700			SI4700	D6-472	TP63	GP2-333-472	UC-5247	5GA-D47	
C38	4700			SI4700	D6-472	TP63	GP2-333-472	UC-5247	5GA-D47	
C39	270			SI270	D6-271	TP41	GP2K-271	UC-5327	5GA-T27	
C40	1000			SI1000	D6-102	K069	GP2L-102	UC-521	5HK-D1	
C41	1000			SI1000	D6-102	K069	GP2L-102	UC-521	5HK-D1	
C42	. 05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C43	. 05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C44	270			SI270	D6-271	TP41	GP2K-271	UC-5327	5GA-T27	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	Harman-Kardon PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C45	4700			SI4700	D6-472	TP63	GP2-333-472	UC-5247	5GA-D47	
C46	2200			SI2200	D6-222	TP57	GP2-333-222	UC-5222	5GA-D22	
C47	.02	200		BPD-02	DF-203	CUB2S2	817-02	PT412	2TM-S2	
C48	.01	200		BPD-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C49	.02	200		BPD-02	DF-203	CUB2S2	817-02	PT412	2TM-S2	
C50	.05	400		BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C51	.05	400		BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C52	.05	400		BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C53	.05	400		BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C54	10000			BPD-01	DD-103	K082	811-01	DC511	5HK-S1	
C55	.05	600		BPD-05	DF-503	CUB6S5		PT615	6TM-S5	

Note 1: Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	Harman-Kardon PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	Switch		RV24721					Contour
B	1Meg	½						Loudness, Tap② 450K & 700K
C	Switch							Power On-Off
R2A	1Meg	½	RV33897	AB-70	A47-1Meg-Z	Q13-137	U-53	Bass
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	Attach to R2A
R3A	1Meg	½	RV33897	AB-70	A47-1Meg-Z	Q13-137	U-53	Treble
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	Attach to R3A
R4	50Ω	2						Hum Balance-Wire-wound

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Harman-Kardon PART No.	IRC PART No.	NOTES
R5	68Ω			BTS-68	
R6	10K			BTS-10K	
R7	1000Ω			BTS-1000	
R8	100Ω			BTS-100	
R9	470K			BTS-470K	
R10	1Meg			BTS-1Meg	
R11	560Ω			BTS-560	
R12	3.3Meg			BTS-3.3Meg	
R13	1000Ω			BTS-1000	
R14	1Meg			BTS-1Meg	
R15	22K			BTS-22K	
R16	1Meg			BTS-1Meg	
R17	100K			BTS-100K	Note 1
R18	1000Ω			BTS-1000	
R19	47K			BTS-47K	
R20	470K			BTS-470K	
R21	1000Ω			BTS-1000	
R22	100K			BTS-100K	
R23	15K			BTS-15K	
R24	15K			BTS-15K	
R25	100K			BTS-100K	
R26	100K			BTS-100K	
R27	68K			BTS-68K	
R28	220Ω			BTS-220	
R29	47K			BTS-47K	
R30	270K			BTS-270K	
R31	560Ω			BTS-560	
R32	220K			BTS-220K	
R33	1Meg			BTS-1Meg	
R34	1500Ω			BTS-1500	
R35	3300Ω			BTS-3300	
R36	68K			BTS-68K	
R37	100K			BTS-100K	

ITEM No.	RATING OHMS	RATING WATT	Harman-Kardon PART No.	IRC PART No.	NOTES
R38	470K			BTS-470K	
R39	68K			BTS-68K	
R40	10K			BTS-10K	
R41	270K			BTS-270K	
R42	100K			BTS-100K	
R43	47K			BTS-47K	
R44	27K			BTS-27K	
R45	100K			BTS-100K	
R46	47K			BTS-47K	
R47	27K			BTS-27K	
R48	12K			BTS-12K	
R49	10K			BTS-10K	
R50	100K			BTS-100K	
R51	22K			BTS-22K	
R52	68K			BTS-68K	
R53	22K			BTS-22K	
R54	33K			BTS-33K	
R55	100K			BTS-100K	
R56	820Ω			BTS-820	
R57	47K			BTS-47K	
R58	47K			BTS-47K	
R59	470K			BTS-470K	
R60	470K			BTS-470K	
R61	560Ω			BTS-560	
R62	47K			BTS-47K	
R63	47K			BTS-47K	
R64	100K			BTS-100K	
R65	100K			BTS-100K	
R66	350Ω	10		1 3/4A-350	
R67	82K			BTS-82K	Note 2
R68	68Ω	1		BTA-68	
R69	330Ω			BTS-330	
R70	330Ω			BTS-330	

Note 1: Not used in some versions.
Note 2: Some versions use 56K in this application.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	RATING SEC. 4	RATING SEC. 5	Harman-Kardon PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC ⓐ .82A	615VCT ⓑ .087A	5VAC ⓐ 2A	6.3VAC ⓐ 2.3A	6.3VAC ⓑ 2.62A	132VAC ⓑ .029A	FT421060					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	Harman-Kardon PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	6000Ω	16Ω tap ⓐ 8Ω	FT421061						

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	Harman-Kardon PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	RF Choke	.8Ω			19-1000		4602	1 Microhenry, IRC part #CLA
L2	RF Choke	3Ω						3.3 Microhenries, IRC part #CLA
L3	FM RF Coil	0Ω						
L4	FM Osc. Coil	0Ω						
L5	Cathode Choke	.8Ω			19-1000		4602	1 Microhenry, IRC part #CLA
L6	RF Choke	.8Ω			19-1000		4602	1 Microhenry, IRC part #CLA
L7	AM Loop Stick	.1Ω	.4Ω	GL421119				
L8	AM Osc. Coil	4Ω		GL24601				Tapped ⓐ .4Ω
L9	1st FM IF	.6Ω	.6Ω	GT24605	16-3487	FM-254	1463	
L10	1st AM IF	16Ω	16Ω	GT24610	16-6758	BC-352	12-C1	
L11	2nd FM IF	.7Ω	.7Ω	GT24606	16-3487	FM-254	1463	
L12	2nd AM IF	16Ω	16Ω	GT24610	16-6758	BC-353	12-C2	
L13	3rd FM IF	.6Ω	.6Ω	GT24605	16-3487	FM-254	1463	
L14	Discriminator	.7Ω	.5ΩCT	GT481423	17-3494	FM-253	1464	

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	Harman-Kardon PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M1	.052A	Z20690	1263A	RS065Q	6S65	8J1	65	

MISCELLANEOUS

ITEM No.	PART NAME	Harman-Kardon PART No.	NOTES
M2	Dial Light		#47
M3	Dial Light		#47
M4	Tuning Cap.	JV471083	4 Gang (AM Sections: 20-527MMF, 28-200MMF)
M5	Switch	ER421069	Selector & Record Compensation (Rotary, Wafer Type)
M6	Switch	ES26798	GE-Pickering (SPST - Slide Type)
	Knob	P24779	Contour Switch
	Knob	P24780	Control (3 used)
	Knob	P24781	Tuning
	Knob	P24782	On-Off-Loudness
	Dial Glass	P421064	
	Dial Pointer	Z24773	

PHOTOFACT* Folder

*TRADE MARK

HOFFMAN MODELS B3011, -U, B3031, -U, M3011, -U, M3031, -U, P3011, -U, P3031, -U, P7001, -U, W3011, -U (Ch. 416, -U)

IMPORTANT FILING NOTICE

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HOFFMAN MODELS B3011, -U, B3031, -U, M3011, -U, M3031, -U, P3011, -U, P3031, -U, P7001, -U, W3011, -U (Ch. 416, -U)

HOFFMAN MODEL M3011-U (Ch. 416-U)

TRADE NAME	Hoffman	MODELS	CHASSIS
		B3011, B3031, M3011, M3031, P3011, P3031, P7001, W3011	416
		B3011-U, B3031-U, M3011-U, M3031-U, P3011-U, P3031-U, P7001-U, W3011-U	416-U
MANUFACTURER	Hoffman Radio Corp., 6200 S. Avalon Blvd., Los Angeles 3, Calif.		
TYPE SET	Television Receiver		
TUBES	Twenty-Six		
POWER SUPPLY	110-120 Volts AC - 60 Cycle	RATING 2.25 Amp. @ 117 Volts AC	
TUNING RANGE -	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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Tube Placement Chart (Top View) 5

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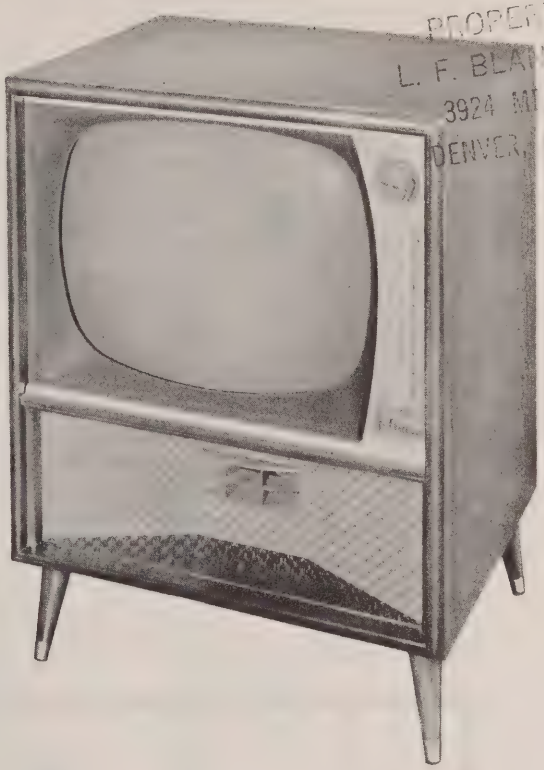
DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 2 metal screws holding cover over 6 control knobs.
2. Remove 9 push-on type control knobs from front panel of cabinet.
3. Remove 5 wood screws and 1 metal screw. Remove rear cover.
4. Disconnect picture tube socket, HV lead, yoke plug and speaker leads.
5. Remove 2 chassis bolts and 1 screw holding bracket at the rear of chassis. Remove chassis.
6. Remove 10 wood screws. Remove 3 speakers.



MODEL	CHASSIS
M3011-U	Ch. 416-U

HOFFMAN MODELS B3011, -U, B3031, -U, M3011, -U, M3031, -U, P3011, -U, P3031, -U, P7001, -U, W3011, -U (Ch. 416, -U)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF Tuner Oscillator Circuit may be accomplished by removal of the Channel Selector and Fine Tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the Channel Selector shaft.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 4 wood screws holding metal molding at top edge of the safety glass. Remove molding and safety glass. Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator is located on the rear panel of the chassis. Adjust the horizontal frequency until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (A4) located on top of the chassis.

CENTERING

Centering is accomplished mechanically by means of a centering lever on the P. M. Focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

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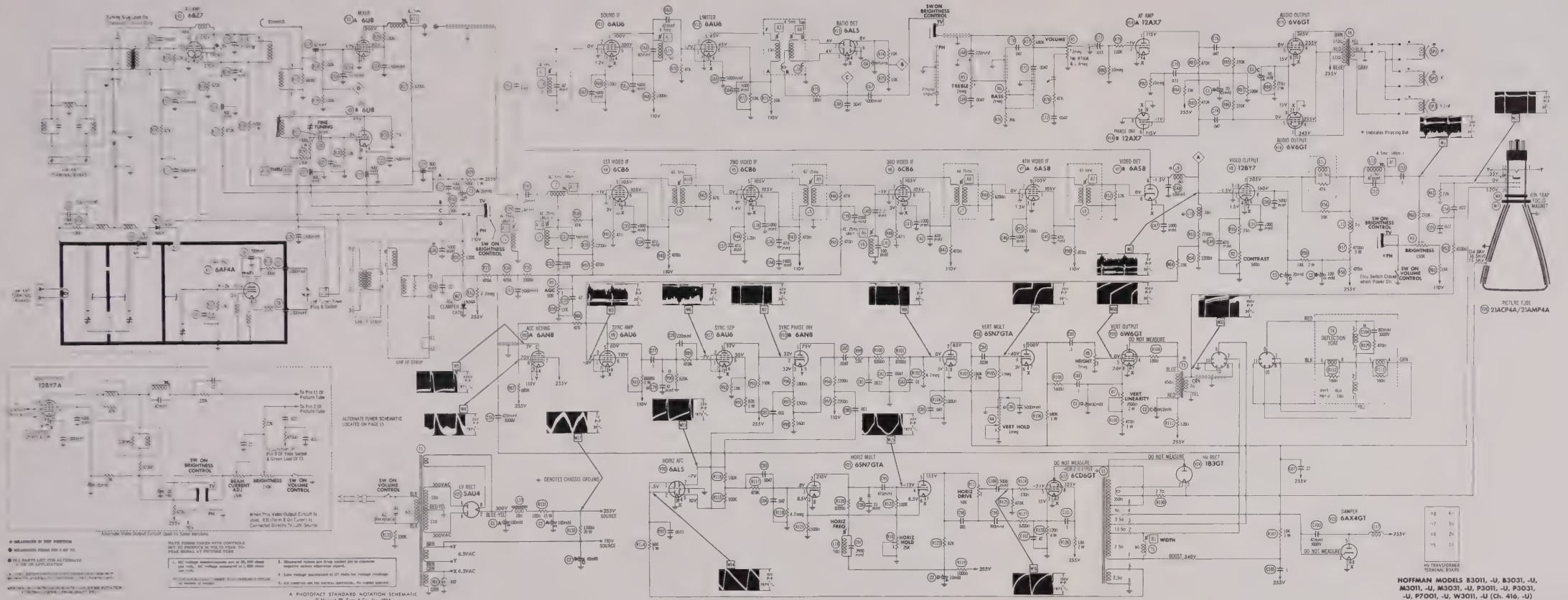
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A PHOTOFACT STANDARD NOTATION SCHEMATIC
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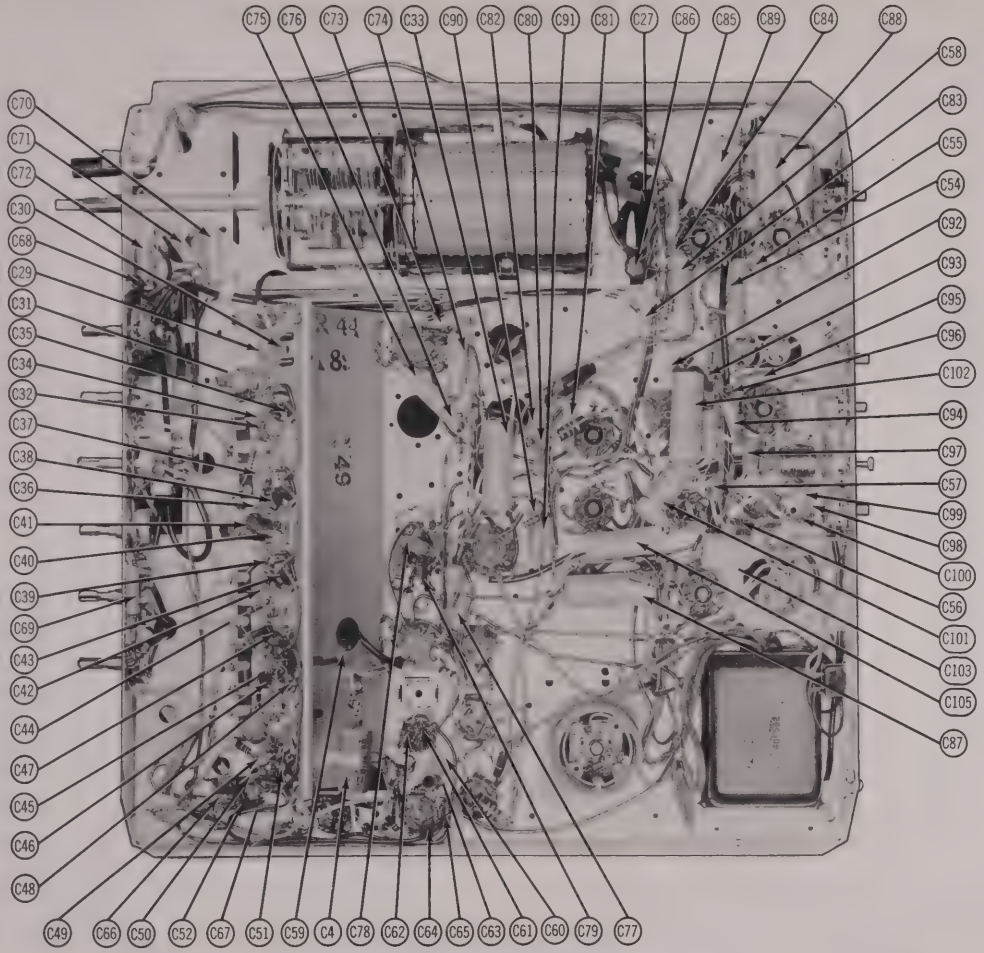
ALTERNATE TUNER SCHEMATIC LOCATED ON PAGE 13
DENOTES CHASSIS GROUND
DO NOT MEASURE
SW ON BRIGHTNESS CONTROL
SW ON VOLUME CONTROL
PICTURE TUBE
21ACP4A/21AMP4A

HOFFMAN MODELS B3011, -U, B3031, -U, M3011, -U, M3031, -U, P3011, -U, P3031, -U, P7001, -U, W3011, -U (Ch. 416, -U)



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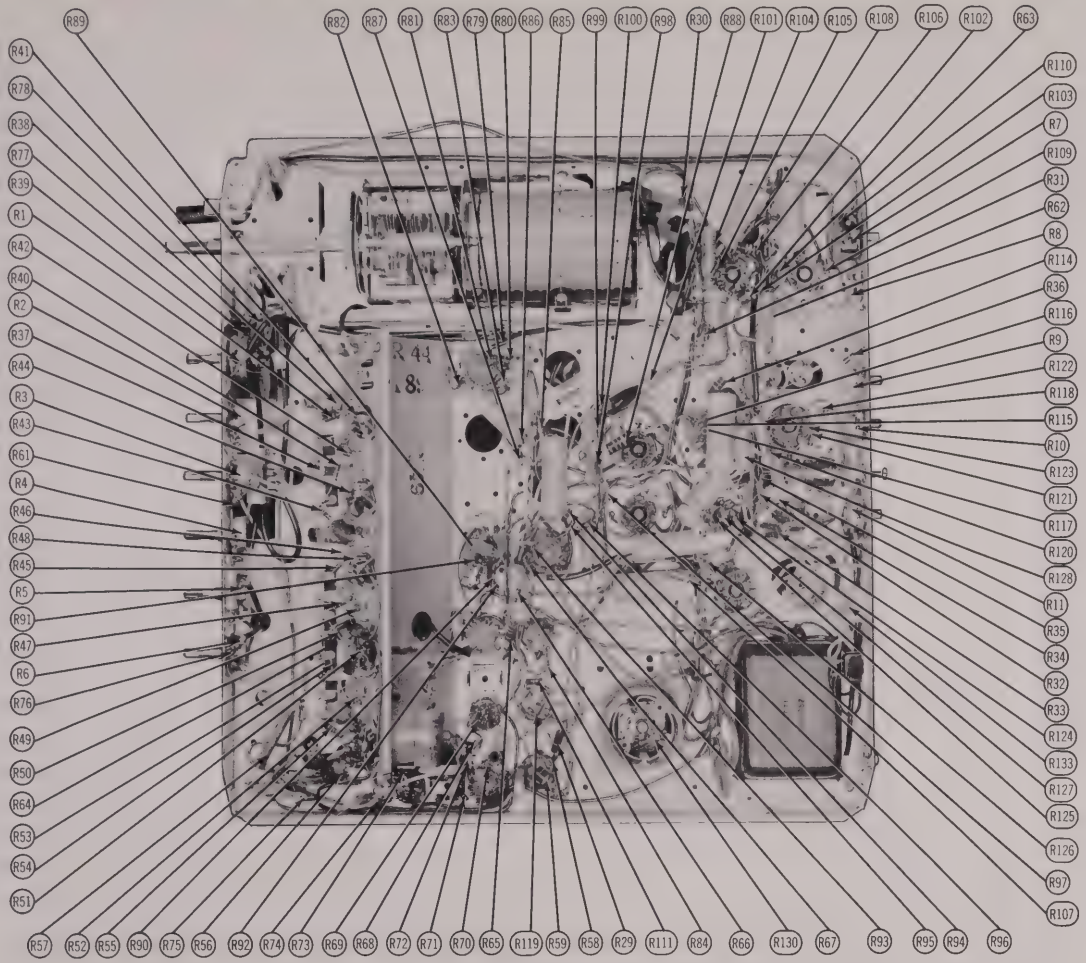
D[illegible] RADO

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

TUBE PLACEMENT CHART

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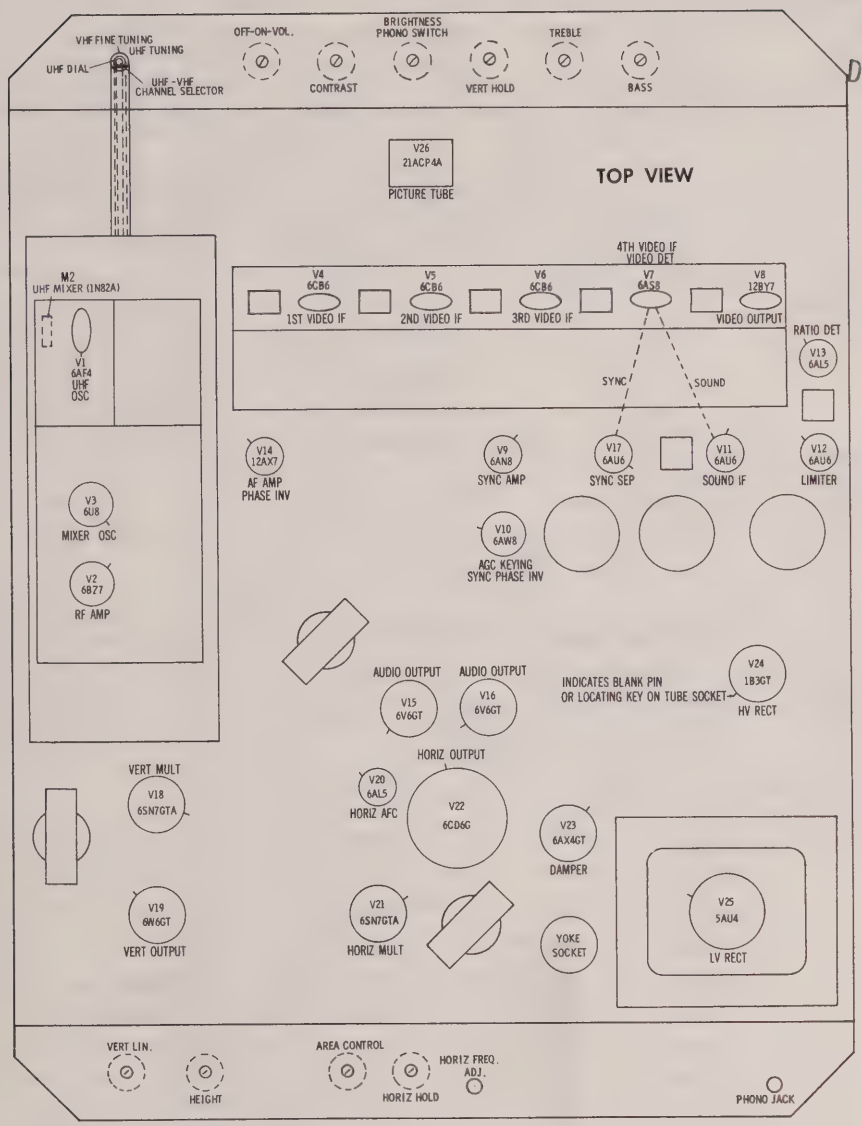


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V25

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, V5, V6, V7 (V1 UHF only)
No pic, no sound, has snow - V2, V3, V4
No pic, has sound, has raster - V8, V10, V26
Has pic, no sound - V11, V12, V13, V14, V15, V16
Overloaded picture - V10

SYNC FAILURE
No vert. sync - V10, V18
No horiz. sync - V10, V20, V21
No vert. or horiz. sync - V9, V10, V17

SWEEP FAILURE
No raster, has sound - V21, V22, V23, V24, V26
No vertical deflection - V18, V19
Poor vert. linearity or foldover - V18, V19
Poor horiz. linearity or foldover - V21, V22, V23
Narrow picture - V21, V22, V23, V24, V25
Vert. off freq. - V10, V18
Horiz. off freq. - V10, V20, V21

HOFFMAN MODELS B3011, -U, B3031, -U, M3011, -U, M3031, -U, P3011, -U, P3031, -U, P7001, -U, W3011, -U (Ch. 416, -U)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Do not remove (V21) to eliminate the high voltage shock hazard.
Switch the tuner between channels so that the detent roller rests on one of the high points of the drum disc. This will disable the local oscillator and reduce the possibility of erroneous indications.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.005MFD	High side to point (A). Low side to chassis.	4.5MC (unmod)	Between any two channels.	DC probe to point (B). Common to chassis.	A1, A2, A3	Attenuate signal level to obtain 5 volts on VTVM. Adjust for maximum deflection.
2.	"	"	"	"	DC probe to point (C). Common to chassis.	A4	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.005MFD	High side to point (A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp. thru 10K to point (B). Low side to chassis.	A1, A2, A3	Disconnect stabilizing capacitor (C4). Adjust A1 and A2 for curve of maximum amplitude and symmetry similar to Fig. 1.
2.	"	"	"	"	"	Vert. amp. thru 10K to point (C). Low side to chassis.	A4	Reconnect C4. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 2. SLIGHTLY retouch A3 for maximum amplitude and straightness of crossover lines

4.5MC TRAP ALIGNMENT

Turn contrast control fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
3.	.005MFD	High side to point (A). Low side to chassis.	4.5MC (unmod)	Between any two channels.	DC probe to pin 11 (cathode) of picture tube thru detector (Fig. 3). Common to chassis.	A5	Adjust for MINIMUM deflection.

VIDEO IF ALIGNMENT

Turn the contrast control fully counter-clockwise. Connect the negative lead of a 3 volt battery to the ungrounded side of C33. Connect the positive lead to chassis.
Attenuate generator as low as possible to obtain readings.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	Direct	High side to an ungrounded tube shield floating over converter tube. Low side to chassis.	41.25MC (unmod)	Set between any two channels.	DC probe to point (A). Common to chassis.	A6	Adjust for MINIMUM deflection.
5.	"	"	43.0MC	"	"	A7	Adjust for maximum deflection.
6.	"	"	44.75MC	"	"	A8	"
7.	"	"	42.25MC	"	"	A9	"
8.	"	"	45.3MC	"	"	A10	"
9.	"	"	42.5MC	"	"	A11	Adjust for MINIMUM deflection.
10.	"	"	42.5MC	"	"	A12	Adjust for maximum deflection.
11.	"	"	39.75MC	"	"	A13	Adjust for MINIMUM deflection.
12.	"	"	47.25MC	"	"	A14	"
13.	"	"	42.5MC	"	"	A12	Readjust for maximum deflection.
14.	"	"	42.25MC	"	"	A11	Readjust A11 for maximum deflection. Repeat steps 4 thru 14 until no further improvement is noted.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Connect bias as under "Video IF Alignment"

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
15.	Direct	High side to an ungrounded tube shield floating over converter tube. Low side to chassis.	43.5MC (10MC Swp)	39.75MC 41.25MC 42.0MC 45.75MC 47.25MC	Set channel selector between any two channels.	Vert. amp. thru 10K to point (A). Low side to chassis.		Check for response curve similar to Fig. 4. Use high scope gain and sweep generator output to view trap markers. If necessary, retouch A7, A9 and A10 for desired response. Bandpass should be approximately 3.75MC. Adjust A10 to place 45.75MC at 50% on response curve. Adjust A9 to place 42.0MC marker. Adjust A7 to eliminate tilt.

FIG. 1

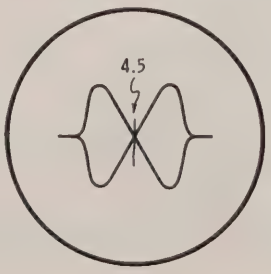


FIG. 2

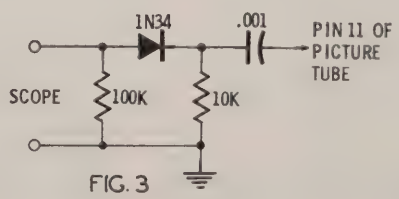


FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT

The channel oscillator adjustment screws in VHF tuner 9889 are reached through a hole just to the right of the channel switch shaft. In UHF-VHF tuner 9881 the channel oscillator adjustment screws are reached through a hole just to the left of the channel switch shaft (hole extends through UHF tuner).
The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect bias as under Video IF Alignment.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
16.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp. thru 10K to point (A). Low side to chassis.	A15	Adjust to place sound marker in trap notch as in Fig. 5. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A16	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A17	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A18	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A19	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A20	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A21	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A22	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A23	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A24	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A25	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A26	

VHF RF AND MIXER ALIGNMENT

Leave bias connected as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
17.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. amp. thru 10K to point (D). Low side to chassis.	A27, A28, A29	Adjust for response curve similar to Fig. 6 with markers above 90%.
18.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		If markers fall below 70% on any one channel make compromise adjustment of A27, A28 and A29 with channel switch set to that channel. Check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

UHF OSCILLATOR ALIGNMENT FOR UHF-VHF TUNER 9881

In the event the UHF oscillator tube is replaced, it is recommended that several tubes be tried and the one which works best should be used. Alignment of this portion of the tuner should not be required in the field.

UHF RF AND MIXER ALIGNMENT FOR UHF-VHF TUNER 9881

The RF and Mixer portion of these tuners have been properly aligned at the factory and are very stable. Alignment should not be required in the field.

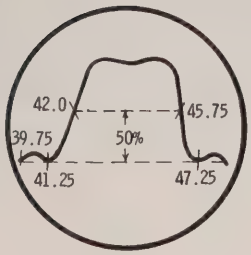


FIG.4

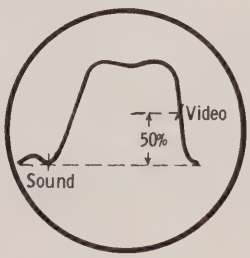


FIG.5

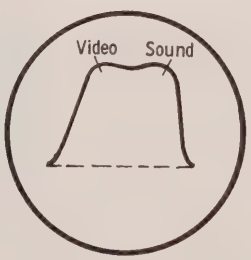
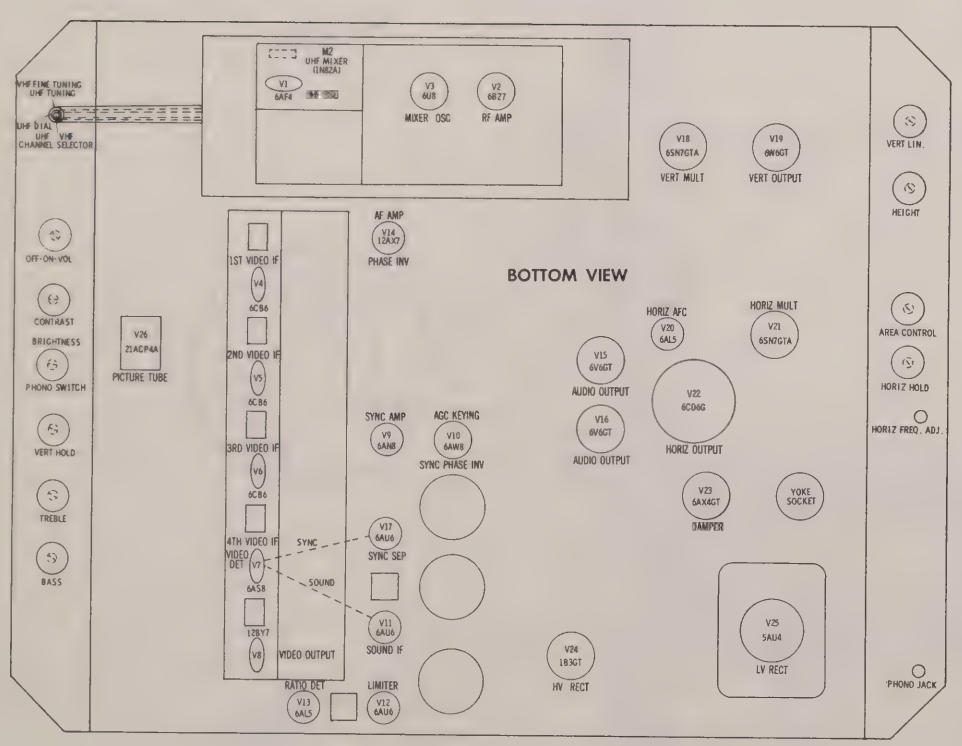


FIG.6

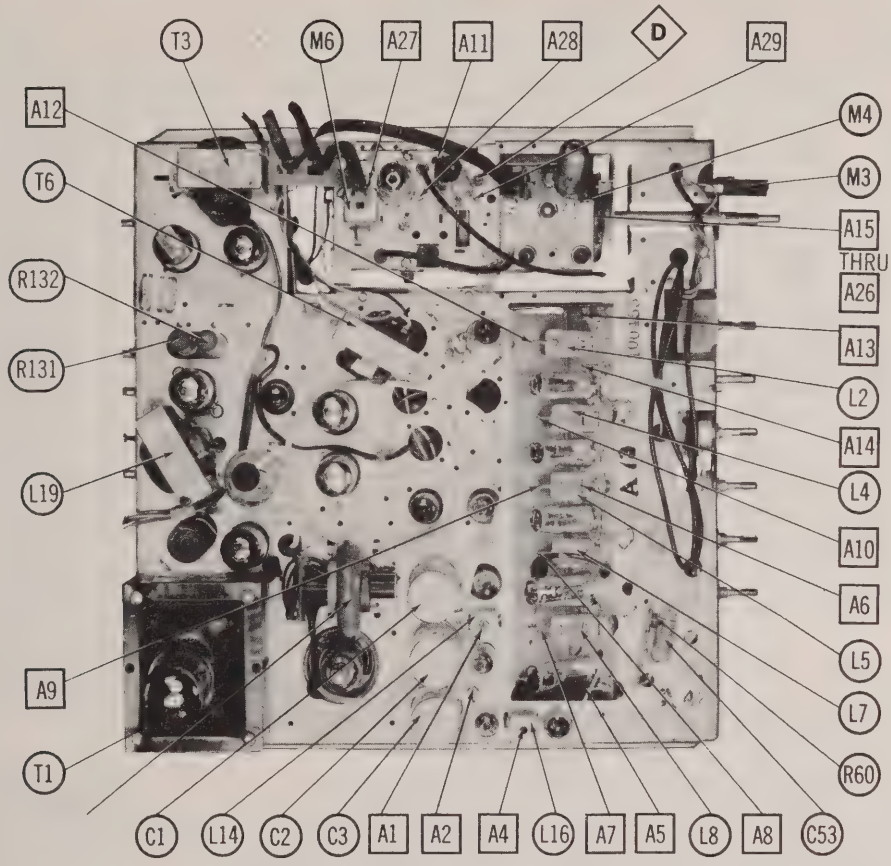
TUBE PLACEMENT CHART



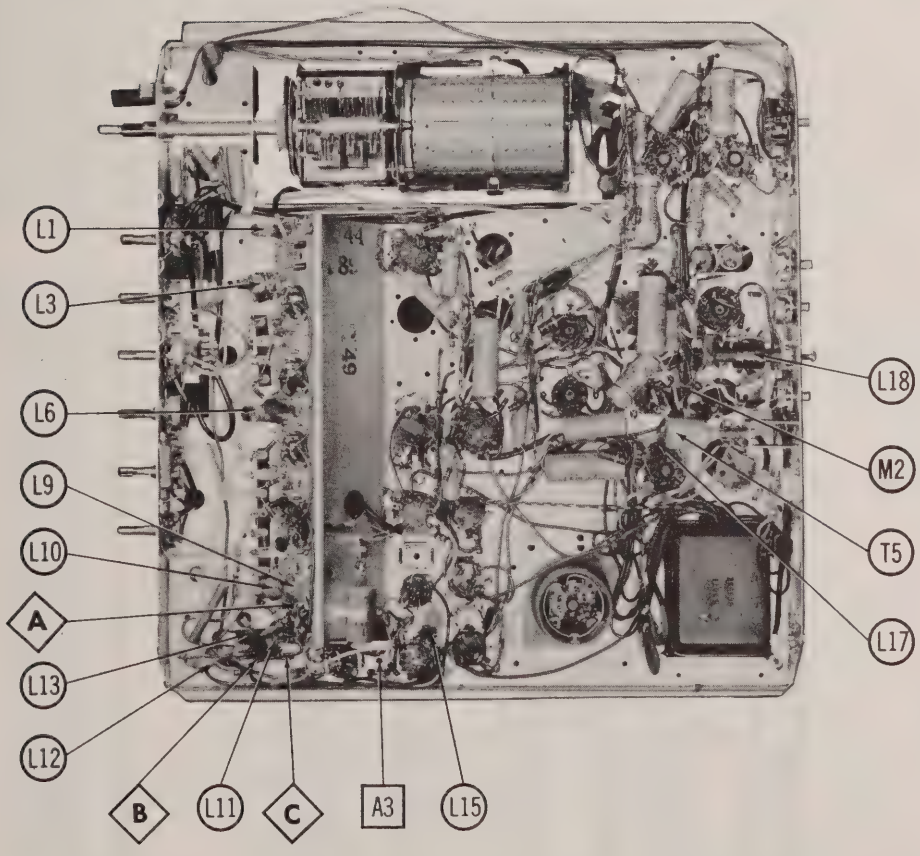
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AF4A	*†5000Ω	10K	.1Ω	0Ω	0Ω	10K	*†5000Ω		
V2	6BZ7	†3000Ω	300K	INF	0Ω	.1Ω	INF	700K	0Ω	†3000Ω
V3	6U8	†5000Ω	200K	†100K	.1Ω	0Ω	†10K	0Ω	0Ω	10K
V4	6CB6	50K	47Ω	.1Ω	0Ω	†2000Ω	†2000Ω	0Ω		
V5	6CB6	.1Ω	120Ω	.1Ω	0Ω	†2000Ω	†2000Ω	0Ω		
V6	6CB6	50K	47Ω	.1Ω	0Ω	†2000Ω	†2000Ω	0Ω		
V7	6AS8	†2000Ω	.1Ω	180Ω	0Ω	.1Ω	5000Ω	0Ω	.1Ω	†2000Ω
V8	12BY7	450Ω	5000Ω	0Ω	0Ω	0Ω	.1Ω	†5300Ω	†18K	0Ω
V9	6AU6	35K	0Ω	0Ω	.1Ω	†8500Ω	†1600Ω	0Ω		
V10	6AN8	†6000Ω	†330K	3800Ω	†1600Ω	†1600Ω	400K	†130Ω	†50K	†1600Ω
V11	6AU6	2Ω	0Ω	0Ω	.1Ω	†2500Ω	†2500Ω	120Ω		
V12	6AU6	47K	0Ω	0Ω	.1Ω	†10K	†10K	0Ω		
V13	6AL5	INF	INF	0Ω	.1Ω	20K	0Ω	0Ω		
V14	12AX7	†500K	10Meg	0Ω	.1Ω	.1Ω	†500K	10Meg	0Ω	0Ω
V15	6V6GT	NC	.1Ω	†300Ω	†130Ω	370K	NC	0Ω	270Ω	
V16	6V6GT	NC	.1Ω	†300Ω	†130Ω	370K	NC	0Ω	270Ω	
V17	6AU6	1.2Meg	0Ω	0Ω	.1Ω	†330K	†8200Ω	0Ω		
V18	6SN7GTA	4.7Meg	▲190K	1000Ω	1.5Meg	▲700K	1000Ω	.1Ω	0Ω	
V19	6W6GT	TP	0Ω	†700Ω	†800Ω	1.2Meg	NC	.1Ω	1000Ω	
V20	6AL5	68K	68K	0Ω	.1Ω	5Meg	NC	5Meg		
V21	6SN7GTA	5Meg	†9500Ω	1500Ω	100K	†85K	1500Ω	.1Ω	0Ω	
V22	6CD6G	NC	.1Ω	120Ω	TP	470K	TP	0Ω	†18K	TOP CAP ▲9Ω
V23	6AX4GT	TP	NC	INF	NC	†130Ω	NC	0Ω	.1Ω	
V24	1B3GT	PINS 1 - 8 HAVE INFINITE RESISTANCE								TOP CAP ▲360Ω
V25	5AU4	INF	10K	INF	11Ω	INF	10Ω	INF	10K	
V26	21ACP4A	†1600Ω	22K	Pin 10 ▲10K	Pin 11 †400K	Pin 12 †1600Ω				

* MEASURED IN UHF POSITION.
† MEASURED FROM PIN 2 OF V25.
▲ MEASURED FROM PIN 3 OF V23.
TP TIE POINT
NC NO CONNECTION



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

SET 337 FOLDER 10

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	UHF Osc.	6AF4A	
V2	RF Amp.	6BZ7	
V3	Mixer Osc	6U8	
V4	1st Video IF Amp.	6CB6	
V5	2nd Video IF Amp.	6CB6	
V6	3rd Video IF Amp.	6CB6	
V7	4th Video IF Amp. - Video Det.	6AS8	
V8	Video Output	12BY7	
V9	Sync Amp.	6AU8	
V10	AGC Keying- Sync Stripper	6AN8	
V11	Sound IF Amp.	6AU8	
V12	Limiter	6AU8	
V13	Ratio Det.	6AL5	
V14	AF Amp. -Phase Inv	12AX7	
V15	Audio Output	6V6GT	
V16	Audio Output	6V6GT	
V17	Sync Sep.	6AU8	
V18	Vert. Mult.	6SN7GTA	
V19	Vert. Output	6V6GT	
V20	Horiz. AFC	6AL5	
V21	Horiz. Mult.	6SN7GTA	
V22	Horiz. Output	6CG8G	
V23	Damper	6AX4GT	
V24	HV Rectifier	1B3GT	
V25	LV Rectifier	5AU4	

PICTURE TUBE

ITEM No	REPLACEMENT DATA					NOTES
	HOFFMAN PART No	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.		
V26	21ACP4A 21ACP4A ①	21AMP4A ①	21ACP4A, 21AMP4A 21AMP4A ①	21ACP4A 21AMP4A ① 21ACP4 21AMP4	① Aluminized ② Silver Screen 85	

ELECTROLYTIC CAPACITORS

ITEM No	RATING CAP	RATING VOLT	REPLACEMENT DATA HOFFMAN PART No	AEROVOX PART No	CORNELL DUBILIER PART No	MALLORY PART No	PYRAMID PART No	SANGAMO PART No	SPRAGUE PART No
C1A	40	350	421A	AFH4-56-75		FP420.26		Q-321.5	TVL-4634
B	30	350							
C	450	50							
D	30	50							
C2A	100	350	433A	AFH4-82-75		FP368.1		Q-925	R324O*
B	60	350				TC78		MT-4540	
C	10	350							
D	10	350							
C3A	30	350	425A	AFH3-155-80	D006 BR2015	FP395.1 TC84	TMQ-8 TCD-35-350	T-110 FM-4520	R239*
B	100	350							
C	30	350							
C4	5	50	427T-1	SRE50V5	BR550	TC30	TD-5-50	MMT-0505	TVA-1303

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING CAP	RATING VOLT	HOFFMAN PART No	AEROVOX PART No	CENTRALAB PART No	CORNELL DUBILIER PART No	ERIE PART No	MALLORY PART No	SPRAGUE PART No	NOTES
C5	3.6									
C6	200									
C7	1000									
C8	1000									
C9	30			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C10	1000			BPD-0015	DD-152	K071	801-0015	DC525	5HK-D15	
C11	1500									
C12	3-12			NP0-C83	TC2-3A3	Z007	NP0A-030	Z7-553	5TCCB-V33	
C13	3-12									
C14	800				839-3		3U5-01-0R5	CT585A		
C15	5-3									
C16	47									
C17	800									
C18	47				MPT-50		3U5-01-0R5	CT585A		
C19	5-3			N750-DU10	839-3 TCN-10	N018	N750R-100	NT-541	5TCU-Q1	
C20	5									
C21	5			BPD-0015	DD-152	K071	801-0015	DC525	5HK-D15	
C22	800									
C23	800			BPD-0015	DD-152	K071	801-0015	DC525	5HK-D15	
C24	800									
C25	800			BPD-0015	DD-152	K071	801-0015	DC525	5HK-D15	
C26	1500			BPD-005	DD-502	K082	811-005	DC525	5HK-D5	
C27	5000			BPD-005	DD-502	K082	811-005	DC525	5HK-D5	Note 1
C28	5000				DD-502	K082	811-005	DC525	5HK-D5	
C29	14				TC2-24	Z035	NP0-240			
C30	10			NP0-S150	TC2-10	Z018	NP0A-100	Z7-541	5TCC-Q1	
C31	56			NPO-S56	TC2-56	Z036	NPO-347-580			
C32	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C33	47	200		P388N-47			CUB2P47	PT4047	2TM-P47	
C34	470			BPD-00047	DD-471	K080	811-471	UC-5347	5GA-T47	
C35	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C36	470			BPD-00047	DD-471	K080	811-471	UC-5347	5GA-T47	
C37	470			BPD-00047	DD-471	K080	811-471	UC-5347	5GA-T47	
C38	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C39	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C40	2.2			NPO-S2.2	TC2-2R2	Z005	NPO-337-301	ZT-531	5TCC-T1	
C41	100			NPO-D100	TC2-101	T230	NPO-347-580	UC-5347	5GA-T47	
C42	470			BPD-00047	DD-471	K080	811-471	UC-5347	5HK-D1	
C43	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C44	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C45	470			BPD-00047	DD-471	K080	811-471	UC-5347	5GA-T47	
C46	1000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C47	1000			BPD-001	DD-103	K069	801-001	DC521	5HK-D1	
C48	10			NPO-D10	TC2-10	Z018	NP0A-100	ZT-541	5TCC-Q1	
C49	470			BPD-00047	DD-471	K080	811-471	UC-5347	5GA-T47	Note 2
C50	5000			BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C51	5000			BPD-001	DD-102	K069	801-001	DC521	5HK-D1	
C52	47			P388N-1			CUB4P1	PT401	4TM-P1	
C53	5-1		600	BPD-02	DF-203		CUBS823	RIT-03	8TM-S23	
C54	022		800	BPD-022	DF-223		CUBS822	RIT-02	8TM-S22	
C55	022		600	BVD-30-470	DD30-471		V3T47	3KV-471	3CNS-Q47	
C56	470		3000	BPD-005	DD-503		K080	811-005	DC525	
C57	5000			P388N-23			CUB2P22	PT4022	2TM-P22	
C58	22		300	NPO-SE2.2	TC2-2R2	Z006	NPOA-2R2		5TCCB-V22	
C59	2.2			NPO-D47	TC2-47	Z033	NPO-338-470	ZT-544	5TCC-Q47	
C60	47			BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C61	5000			BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C62	5000			BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C63	470			NPO-D47	TC2-47	Z033	NPO-338-470	ZT-544	5TCC-Q47	
C64	5000			BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C84	5000			BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C86	5000			BPD-0047	DD-473	CUBD47	811-005	PT5347	5TM-D47	
C87	0047	400		BPD-005	DD-502	K080	811-005	DC535	5HK-D5	
C87	5000									

CAPACITORS (cont)

ITEM No	RATING CAP	RATING VOLT	HOFFMAN PART No	REPLACEMENT DATA AEROVOX PART No	CENTRALAB PART No	CORNELL DUBILIER PART No	ERIE PART No	MALLORY PART No	SPRAGUE PART No	NOTES
C88	220			D1-00032	DD-221	G091	811-221	UC-5383	5GA-T22	
C89	.0047	400		BPD-0047	DH-472	CUBD47	GP3-333-473	PT5347	6TM-D47	
C90	.047	400		BPD-05	DF-503	CUB4S47		PT4147	6TM-S47	
C91	.0047	400		BPD-0047	DH-472	CUBD47	GP3-333-473	PT5347	6TM-D47	
C92	.0047	400		BPD-0047	DH-473	CUBD47	GP3-333-473	PT5347	6TM-D47	
C93	.033	400		BPD-03	DF-303	CUB4S33		PT4133	6TM-S33	
C94	.047	400		BPD-05	DF-503	CUB4S47		PT4147	6TM-S47	
C95	.033	400		BPD-03	DF-303	CUB4S33		PT4133	6TM-S33	
C96	.047	400		BPD-05	DF-503	CUB4S47		PT4147	6TM-S47	
C97	22	500		P388N-1A				PT401	2TM-P1	
C98	220			D1-00033	DD-221	G091	811-221	UC-5323	5GA-T22	
C99	117			NPO-D847	TC2-477	Z033	NPO-338-470	ZT-5447	5TCC-Q47	Note 1
C100	.0047	400		BPD-0047	DH-472	CUBD47	GP3-333-472	UC-5347	5HK-D47	
C101	.0033	200		BPD-0033	DH-332	CUBD33	GP3-333-332	PT5333	5TM-D33	
C102	.0033	200		BPD-0033	DH-332	CUBD33	GP3-333-332	PT5333	5TM-D33	
C103	.01	200		BPD-01	DH-103	CUB4S1	GP3-333-103	PT4U	M5-339	
C104	.0039	400		1464-0039		CUBD39			5TM-D47	
C105	.047	200		BPD-05	DF-503	CUB4S47		PT4147	M5-D5	
C106	5000			BPD-005	DD-503	K080	811-005	DC535	6TM-P22	Note 1
C107	22	500		P388N-23		CUB6P22		PT6022	6TM-P2	
C108	1	600		P688N-1	DF-104	CUB6P1		PT601	6TM-P1	
C109	1	600		P688N-1	DF-104	CUB6P1		PT601	6TM-P1	
C90	.001	400		1464-001		1RSD1	811-102	MCB255	M5-21	
C91	.001	400		1464-001		1RSD1	811-103	MCB255	M5-21	
C93	.0033	400		BPD-0033	DH-332	CUBD33	GP3-333-332	PT5333	6TM-D33	
C93	.0047	400		BPD-0047	DH-472	CUBD47	GP3-333-472	PT5347	6TM-D47	
C94	22	500		P388N-23		CUB2P22		PT4022	2TM-P22	
C95	470	500		1464-00047	DH-471	SRST47	811-471		5TCC-Q47	
C96	3			BPD-D33	DC-33	K090	3U5-01-0R5	UC-5433	5HK-D3	Note 1
C97	3900	500		1464-0039		1RSD39			M5-339	
C98	.001	400		BPD-001	DH-102	CUBD1	811-103	PT831	M5-21	
C99	.001	500			DH-681	SRST39	811-391		M5-339	
C100	5000			BPD-005	DD-502	K080	811-005	DC525	5HK-D5	
C101	1	800		P688N-1	DF-104	CUB6P1		PT601	6TM-P1	
C103	.47	300		P788N-47		CUB2P47		PT6047	2TM-P47	
C104	82	3000		1464-0033		CUBD33	3KV-470	DC30547	3GA-Q47	
C105	82	3000			DD30-810	DF-104				Note 3
C106	1	800		P688N-1	DF-104	CUB6P1		PT601	6TM-P1	

Note 1: Not used in some versions.
Note 2: Some versions may use a 220MMF unit in this application.
Note 3: Some versions may use a 140MMF unit in this application.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA HOFFMAN PART No	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No	MALLORY PART No	INSTALLATION NOTES
R1A	2Meg	½	H4848A	ABT-175		Q13-150JA	UDT-296	Volume tapped @ 700K & 1.4Meg
B	Shaft		Not Req.	AK-4		Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	KB-2		76 2	US-27	Attach to R1A
R2A	500Ω	½	H4850A	AB-4	A47-500-6	Q11-103	TA52L	Contrast
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R2A
R3	150K	½	H4845A					Brightness & Phone Switch
R4A	1Meg	½	H4878A	AB-89	A47-1Meg-S	Q11-137	U54	Vert. Hold
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R4A
R5A	1Meg	½	H4878A	AB-71	A47-2Meg-S	Q11-139	U56	Tweice
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R5A
R6A	2Meg	½	H4878A	AB-75	A47-2Meg-S	Q11-139	U56	Base
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R6A
R7A	2000Ω	2	H4872A	VK-131	A43-2000	WP52000	R2600L	Vert. Linearity (wire-wound)
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R7A
R8A	2Meg	½	H4965	BX-75	A47-2Meg-S	Q11-139	TA26L	Height
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R8A
R9A	50K	½	H4964-2	BX-31	A47-50K-S	Q11-123	TA54L	AGC
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R9A
R10A	25K	½	H4845A	AB-38	A47-25K-S	Q11-120	TA253L	Horiz. Hold
B	Shaft		Not Req.	AK-1	FKS-1/4	Not Req.	Not Req.	Attach to R10A
R11A	50K	½	H4964	BX-31	A47-50K-S	Q11-123	TA54L	Horiz. Drive
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R11A

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING OHMS	RATING WATT	REPLACEMENT DATA HOFFMAN PART No	IRC PART No.	NOTES
R12	10K				
R13	1000Ω			BTS-1000	
R14	100Ω				
R15	47K		BTS-47K	BTS-47K	
R16	22K		BTS-22K	BTS-22K	
R17	470K		BTS-470K	BTS-470K	
R18	680K		BTS-680K	BTS-680K	
R19	1500Ω	1	BTA-1500	BTA-1500	
R20	10K				
R21	3300Ω	1	BTA-3300	BTA-3300	
R22	6800Ω				
R23	27K				
R24	100K		BTS-100K	BTS-100K	
R25	100K		BTS-100K	BTS-100K	
R26	100K		BTS-100K	BTS-100K	
R27	8200Ω		BTS-8200	BTS-8200	
R28	100K		BTS-100K	BTS-100K	
R29	1500Ω	1	BTA-1500	BTA-1500	
R30	150Ω		BTS-150	BTS-150	
R31	120K		BTS-120K	BTS-120K	
R32	2.2Meg	2 5%	BTS-2.2Meg 5%	BTS-2.2Meg 5%	
R33	470K		BTS-470K	BTS-470K	
R34	470K		BTS-470K	BTS-470K	
R35	3300Ω		BTS-3300	BTS-3300	
R36	15K		BTS-15K	BTS-15K	
R37	470Ω		BTS-470	BTS-470	
R38	47K				
R39	2200Ω		BTS-470	BTS-470	
R40	470Ω		BTS-47	BTS-47	
R41	47Ω				
R42	47K				
R43	470Ω		BTS-470	BTS-470	
R44	120Ω		BTS-120	BTS-120	
R45	470Ω		BTS-470	BTS-470	
R46	47K		BTS-47K	BTS-47K	
R47	470Ω		BTS-470	BTS-470	

ITEM No	RATING OHMS	RATING WATT	REPLACEMENT DATA HOFFMAN PART No	IRC PART No.	NOTES
R48	470			BTS-47	
R49	82000				
R50	470Ω			BTS-470	
R51	180Ω			BTS-180	
R52	12K			BTS-12K	
R53	2700Ω			BTS-2700	
R54	2200Ω			BTS-2200	
R55	33Ω			BTS-33	
R56	10K			BTS-10K	
R57	4700Ω	5	446H		
R58	470Ω			BTS-470	
R59	47K	2		BTS-18E	
R60	270K			BTS-270K	
R61	18K			BTS-18K	
R62	22K			BTS-22K	
R63	4700Ω			BTS-4700	
R64	33K			BTS-33K	
R65	6800Ω	1		BTA-6800	
R66	47K			BTS-47K	
R67	680K 5%			BTS-680K 5%	
R68	1000Ω			BTS-100	
R69	120Ω			BTS-120	
R70	47K			BTS-47K	
R71	10K			BTS-10K	
R72	10K			BTS-10K	
R73	180Ω			BTS-180	
R74	10K			BTS-10K	
R75	10K			BTS-10K	
R76	33K			BTS-33K	
R77	680K			BTS-680K	
R78	47K			BTS-47K	
R79	100K			BTS-100K	
R80	10Meg			BTS-10Meg	
R81	470K			BTS-470K	
R82	10Meg			BTS-10Meg	
R83	470K			BTS-470K	
R84	33K			BTS-33K	

RESISTORS (cont)

ITEM No	RATING OHMS	RATING WATT	REPLACEMENT DATA HOFFMAN PART No	IRC PART No.	NOTES
R85	470K			BTS-470K	
R86	470K			BTS-470K	
R87	100K			BTS-100K	
R88	330Ω	3		BTB-370	
R89	470K			BTB-470K	
R90	820K			BTB-820K	Note 1
R91	68K	1		BTA-68K	
R92	18K			BTB-18K	
R93	330K			BTB-330K	
R94	2200Ω			BTB-2200	
R95	2200Ω 5%			BTB-2200 5%	
R96	1800Ω			BTB-1800	
R97	1500Ω 5%			BTB-1500 5%	
R98	100K			BTB-100K	
R99	22K			BTB-22K	
R100	8200Ω			BTB-8200	
R101	8200Ω			BTB-8200	
R102	4.7Meg	3		BTB-4.7Meg	
R103	180K	2		BTB-180K	
R104	1000Ω 5%			BTB-1000 5%	
R105	1Meg			BTB-1Meg	
R106	680K	1		BTA-680K	
R107	150K			BTA-150K	
R108	5800Ω			BTB-5800	
R109	100Ω			BTB-100	

ITEM No	RATING OHMS	RATING WATT	REPLACEMENT DATA HOFFMAN PART No	IRC PART No.	NOTES
R110	470K	1		BTA-470	
R111	1200			BTB-120	
R112	5800				
R113	9660				
R114	68K	1			
R115	100K				
R116	100K				
R117	470K			BTB-4.7Meg	
R118	4.7Meg			BTB-1000	
R119	1000Ω			BTB-3300 5%	
R120	3300Ω 5%			BTB-1500 5%	
R121	1500Ω 5%			BTB-100K	
R122	100K			BTB-56K	
R123	56K			BTB-33K	
R124	33K			BTB-470K	
R125	470K			BTB-8200	
R126	18K	3		BTS-4.7Meg	
R127	4.7Meg			BTB-180K	
R128	180K	2		BTB-1000 5%	
R129	1000Ω 5%			BTB-1Meg	
R130	1Meg			BTA-680K	
R131	680K	1		BTA-150K	
R132	150K			BTA-10K	
R133	10K			BTB-5600	
R134	5600Ω			BTB-100	

Note 1: Some versions use a 470K in this application.

TRANSFORMER (POWER)

ITEM No	RATING PRI.	SEC. 1	SEC. 2	SEC. 3	HOFFMAN PART No.	Halderson PART No.	Merit PART No.	Stancor PART No.	Thorderson PART No.	Triad PART No.
T1	117VAC @ 2.25A	600VCT @ .350A	6V @ 3A	6.3V @ 12A SEC. 4 8.5V @ 1.05A	507L					

① Drill one new mounting hole.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA HOFFMAN PART No	Halderson PART No	Merit PART No	RCA TYPE No	Ram PART No.	Stancor PART No.	Thorderson PART No.	Triad PART No.
T2	Horiz. Output Trans.	515A-2 ① 515A-4 ①							
T3	Vert. Output Trans.	515A-1 ① 515A-3 ①	21900 ② 21900 ③	A-2823 ② A-2842 ③	V307 ② V307	A-8142 ② A-8142 ③	26872 ② 26872	A-108X ② A-108X ③	Y-40-1.6 Y-40-1.6
T4A	Yoke(90°)Horiz(13MR) Vert(49MR)	99765 ②	DF608 ②	MDF-91 ②	237DI ②	DF608 ②		Y-16 ②	
B									
T5	Width Coil (2.7-17MH)	5464	RF800 ②	MWC-11	212RI	200R16	WC-5 ②	WC-18 ②	WC-12 ②

① Alternate Hoffman part number.
② Use 8 to 1 turns ratio.
③ Drill new mounting hole(s).
④ Includes capacitor C84, resistors R112, R113 and R129.
⑤ Connect horiz. yoke damping network across terms #3 and #7.
⑥ Use original horiz. yoke damping network, if necessary.
⑦ Enlarge mounting hole.
⑧ Use terms #1 and #2.
⑨ Use red and blue terms.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE PRI	IMPEDANCE SEC	REPLACEMENT DATA HOFFMAN PART No	Halderson PART No	Merit PART No	Stancor PART No.	Thorderson PART No.	Triad PART No.	NOTES
T6	7 1K	3-4Ω	5482A						

SPEAKER

ITEM No	RATINGS SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA HOFFMAN PART No	QUAM PART No.	RCA TYPE No	NOTES
SP1	6"	PM	3-4Ω	H911J ①	6A2I	229GI	① Used in models W301J, B301J, P301J, W301-U,
SP2	6	PM	3-4Ω	H911J ①	6A2I	229GI	B301-U, P301-U, M301J, M301-U
SP3	5 1/4"	PM	3-4Ω	H908-2	52AI	217SI	② Used to models B303J, P303J, B303J-U,
	6 X 11"	PM		H907D ②			P303J-U, M303J, M303J-U, P700J, P700J-U

COILS (RF-IF)

ITEM No	USE	DC RES PRI	DC RES SEC	HOFFMAN PART No	MEISSNER PART No	MERIT PART No	MILLER PART No.	NOTES
L1	39.75MC Trap	0Ω		5240A				
L2	1st Video IF	30CT		5285A				Tapped
L3	47.25MC Trap	0Ω		5284A				
L4	2nd Video IF	.1Ω	.1Ω	5539				
L5	3rd Video IF	.1Ω	.1Ω	5538				
L6	4.5MC Trap	9Ω		5438				
L7	4th Video IF	.1Ω	.1Ω	5537	17-5904	TV-125	6234	
L8	5th Video IF	.1Ω	.1Ω	5242A	17-5904	TV-125	6234	
L9	Series Peaking Coil	4Ω		5264A	19-3036	TV-180	6176	39 Microhenries-Note 1
L10	Shunt Peaking Coil	28Ω		5434			4652	970 Microhenries-Note 2
L11	Series Peaking Coil	10.5Ω		5330A	19-4201*		8154*	210 Microhenries- Wound on 47K resistor.
L12	Shunt Peaking Coil	7Ω		5331A	19-3100	TV-181	6177	97 Microhenries
L13	4.5MC Trap	1.5Ω		5322A	20-1004	TV-151	1468	
L14	1st Sound IF	2Ω		5308A			1470A	
L15	2nd Sound IF	1.5Ω		5323A	20-1004	TV-151	1469	
L16	Ratio Det.	1Ω	1.5OCT	5252A	17-3497	TV-115	6205	Tertiary Winding = .7Ω
L17	RF Choke	1Ω		5268	19-0303		4908	4 Microhenries

* Parallel with 47K resistor.
Note 1: Some versions may use a 390 Microhenries coil wound on 10Meg resistor in this application.
Note 2: Some versions may use a 970 Microhenries coil wound on 10Meg resistor in this application.

HOFFMAN MODELS B3011-U, B3031-U, -U, M3011-U, -U, M3031, -U, P3011-U, P3031-U, P7001-U, W3011-U, -U (Ch. 416, -U)

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI.	SEC.	HOFFMAN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L18	50Ω		5447	19-1576	TV-163	6210			HS-5	

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	HOFFMAN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L19	.320A	28Ω	1.4HY	5164A	C5037	C2996	C2326①	26C44 ①	C-17X

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		HOFFMAN PART No.	SYLVANIA PART No.	
M1	1N82A		1N82 or 1N82A	UHF Mixer (Clip in)

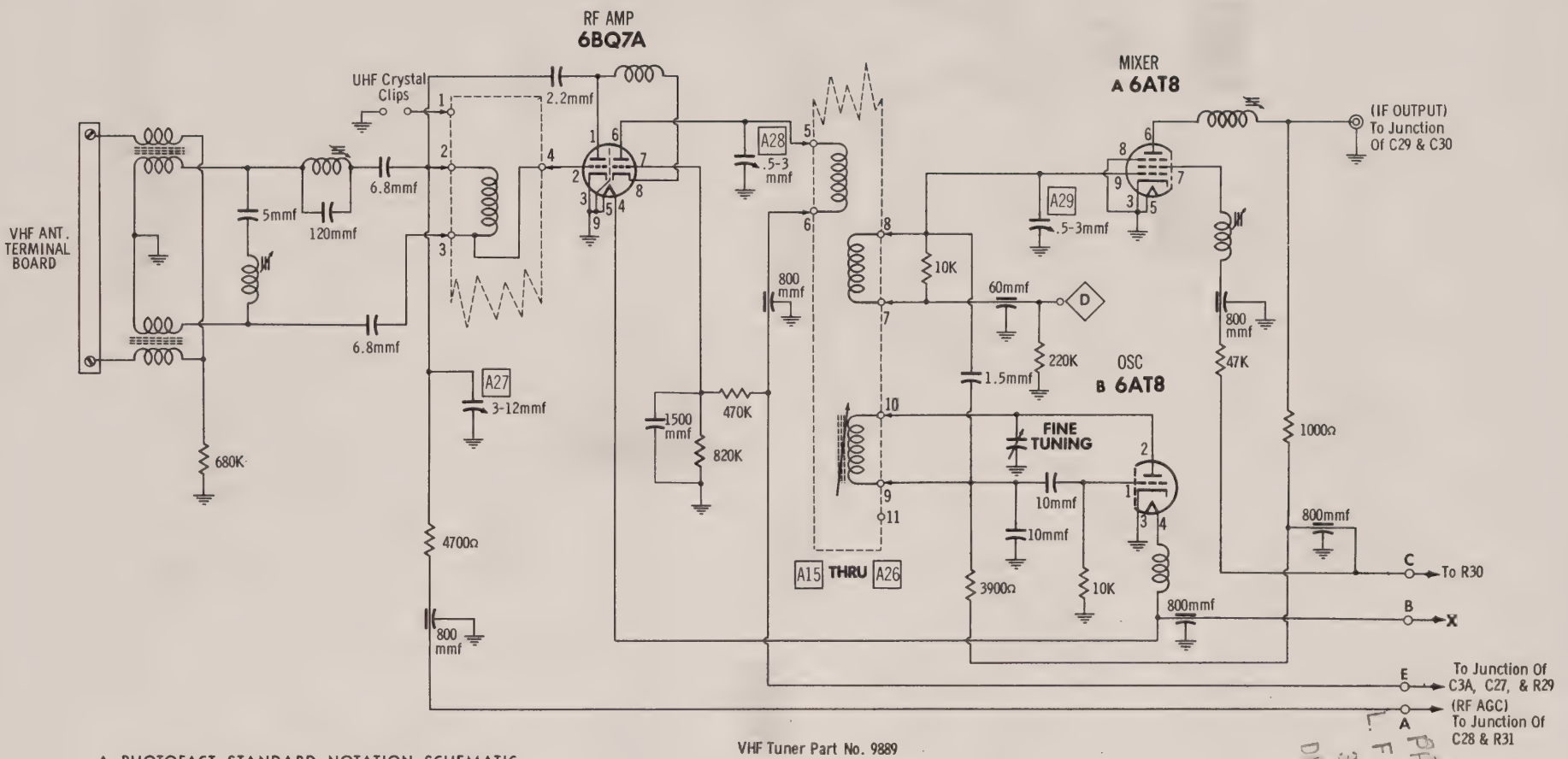
SELENIUM DIODE

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		HOFFMAN PART No.	SYLVANIA PART No.	
M2		10017	1N34A	AGC Clamper

MISCELLANEOUS

ITEM No.	PART NAME	HOFFMAN PART No.	NOTES
M3	Dial Light		#47
M4	Tuner	9881*	VHF-UHF Combination - Chassis 416-U.
M5	Tuner	9889	VHF - Chassis 416.
M6	Trap		VHF Ant. Input Filter
M7	Focus Magnet	9882	Includes Centering Device
M8	Ion Trap	9713	Used with 21" Pix. Tubes.
	Ion Trap	9702	Used with 24" Pix. Tubes.
	Cabinet	7929	Cherry - Models W3011, U;B3011, U;P3011, U.
	Cabinet	7928	Oak - Models W3011, U;B3011, U;P3011, U.
	Cabinet	7926	Walnut - Models W3011, U;B3011, U;P3011, U.
	Cabinet	7927	Models M3011, U.
	Cabinet	7943	Cherry - Models B3031, U; P3031, U.
	Cabinet	7942	Oak - Models B3031, U; P3031, U.
	Cabinet	7941	Models M-3031, U
	Cabinet	7960	Models P-7001, U.
	Knob	H-3842-A	Brightness, Contrast, Tone, Vert. Hold & On-Off-Volume - Models W3011, U; B3011, U; P3011, U; B3031, U; P3031, U;P7001, U.
	Knob	R-3842-A	Brightness, Contrast, Tone, Vert. Hold & On-Off-Volume - Models M3011, U; M3031, U.
	Knob	H-33763	VHF Channel Selector - Models W3011, B3011, P3011, B3031, P3031, P7001.
	Knob	R-33763	VHF Channel Selector - Models M3011, M3031.
	Knob	H-33764	Fine Tuning - Models W3011, B3011, P3011, B3031, P3031, P7001.
	Knob	R-33764	Fine Tuning - Models M3011, M3031.
	Knob	H-33772	UHF Tuner Ass'y. (Front Section) Models W3011U, B3011U, P3011U, B3031U, P3031U, P7001U.
	Knob	R-33772	UHF Tuner Ass'y. (Front Section) Models M3011U, M3031U.
	Knob	H-33773	UHF Tuner Ass'y. (Center Section) Models W3011U, B3011U, P3011U, B3031U, P3031U, P7001U.
	Knob	R-33773	UHF Tuner Ass'y. (Center Section) Models M3011U, M3031U.
	Knob	H-33767	UHF Tuner Ass'y. (Rear Section) Models W3011U, B3011U, P3011U, B3031U, P3031U, P7001U.
	Knob	R-33767	UHF Tuner Ass'y. (Rear Section) Models M3011U, M3031U.
	Safety Glass	804	All Models
	Mask	22066	All Models

* Alternate part no's. 9861 and 9858.



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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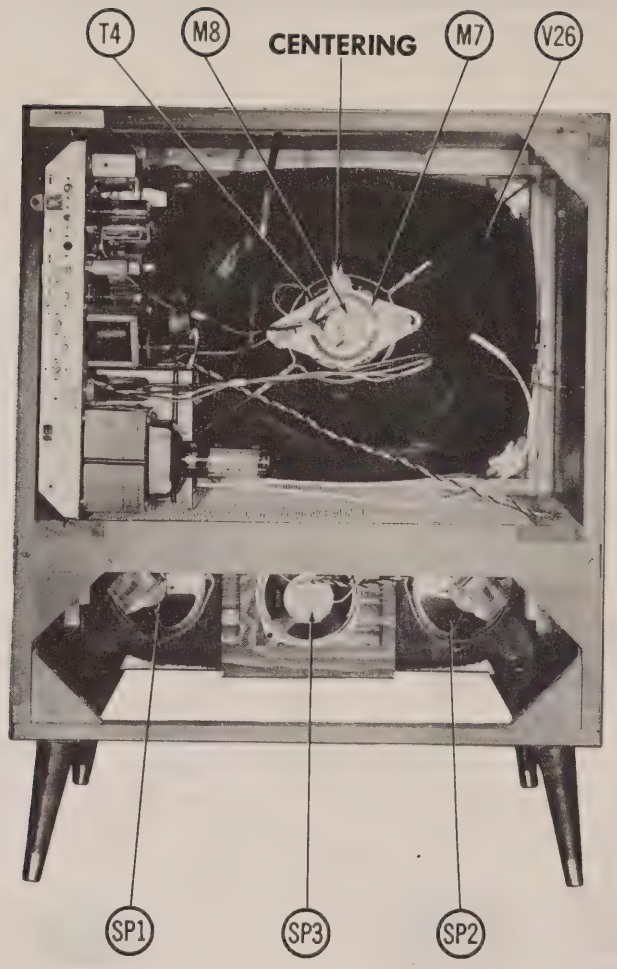
VHF Tuner Part No. 9889

PROPERTY OF: L. F. CLANTENBHIP 3304 ... DENVER, COLORADO

ALTERNATE VHF TUNER SCHEMATIC

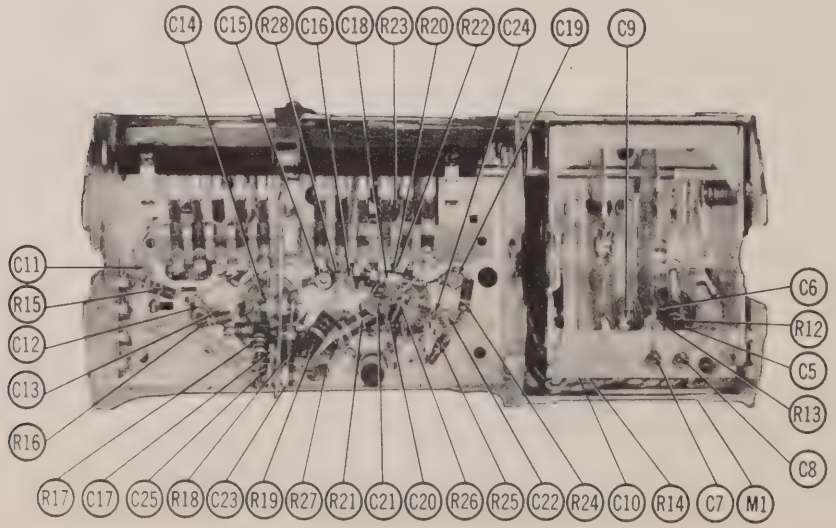


CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern. Turn the horizontal drive control (R11) as far clockwise as possible without the presence of vertical white lines or compression near the center of the picture.

Adjust the horizontal frequency until the picture synchronizes horizontally. Switch off channel and back again. If the picture looses sync, slightly retouch the horizontal frequency.
Adjust the horizontal width slug (B1) for a picture slightly wider than necessary to fill the picture mask horizontally.

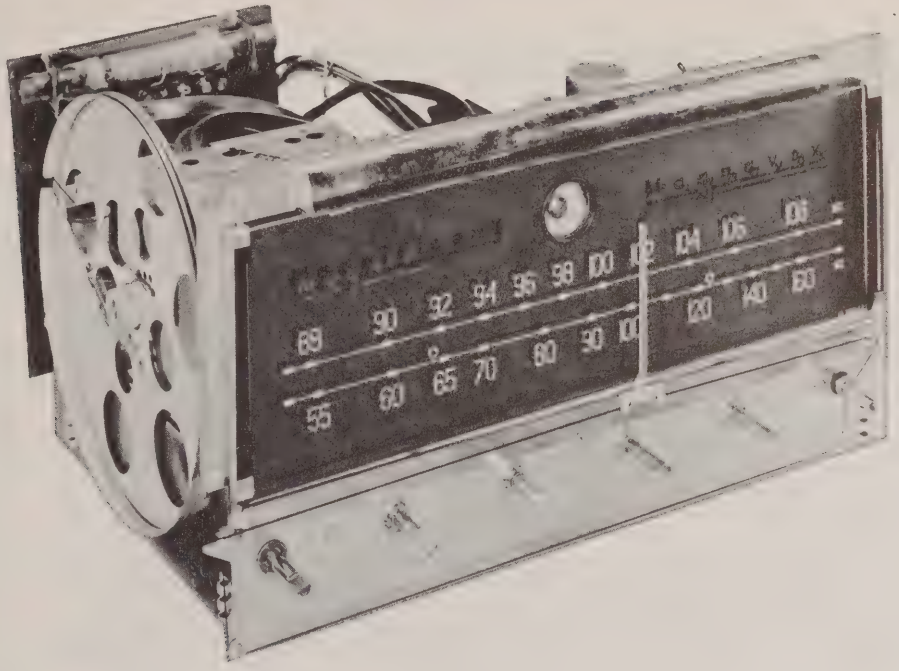


RF TUNER BOTTOM VIEW

RETMA MEMBER

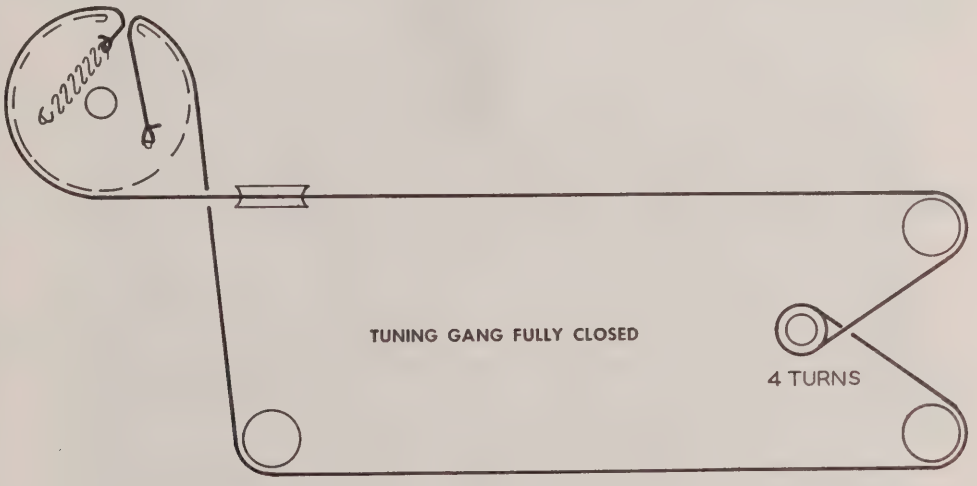
PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE S.
DENVER, COLORADO

MAGNAVOX
CHASSIS CR-723, CR-726



TRADE NAME	Magnavox Chassis CR-723, CR-726
MANUFACTURER	Magnavox Co., 2131 Bueter Rd., Fort Wayne, Ind.
TYPE SET	Externally powered FM-AM Superheterodyne Tuner
TUBES (Nine)	Types 6BZ6 RF Amplifier, 6U8 FM Mixer-Osc., 6BE6 AM Converter, 6BA6 1st.IF Amplifier, 6BA6 2nd. FM IF Amplifier, 6AL5 Ratio Detector, 6AV6 Preamplifier, 12AT7 AF Amp.-Cathode Follower, 6E5 Tuning Ind.
TUNING RANGE - BROADCAST	540KC-1620KC FREQ.MOD. 88MC-108MC

MAGNAVOX
CHASSIS CR-723, CR-726



DIAL CORD STRINGING

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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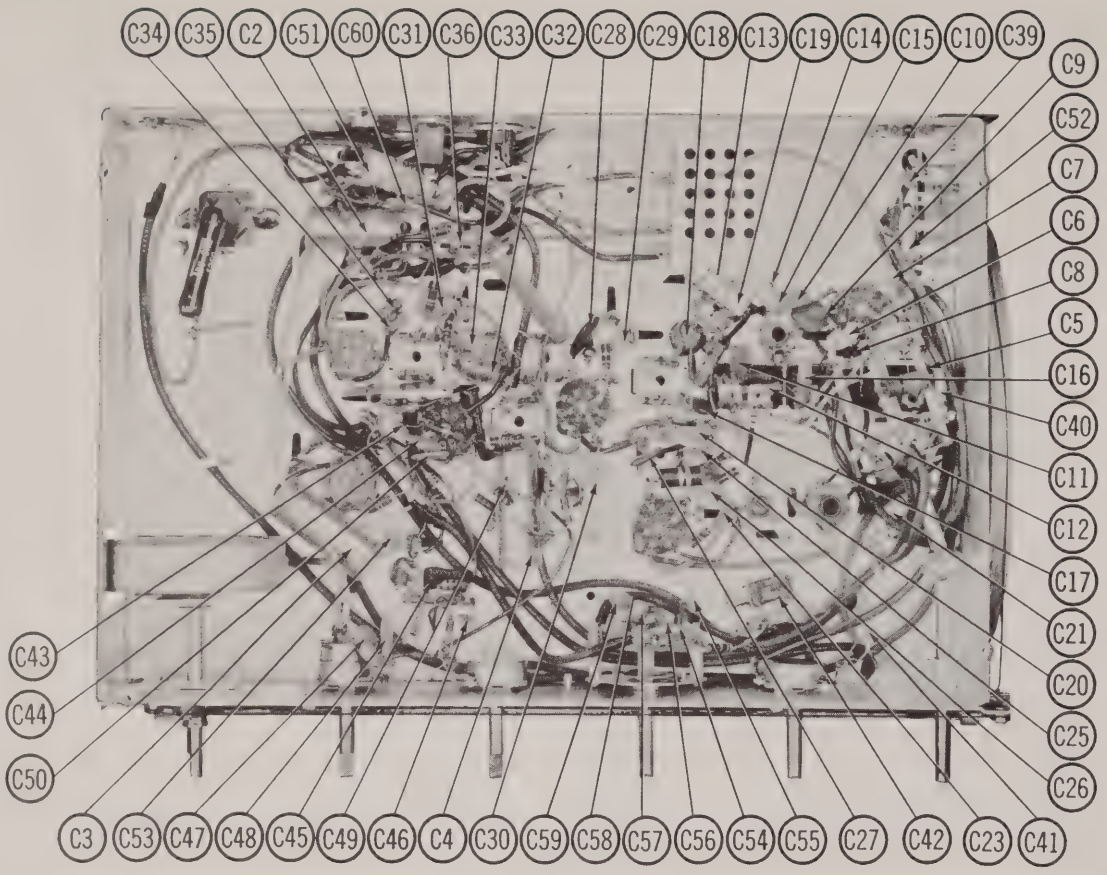
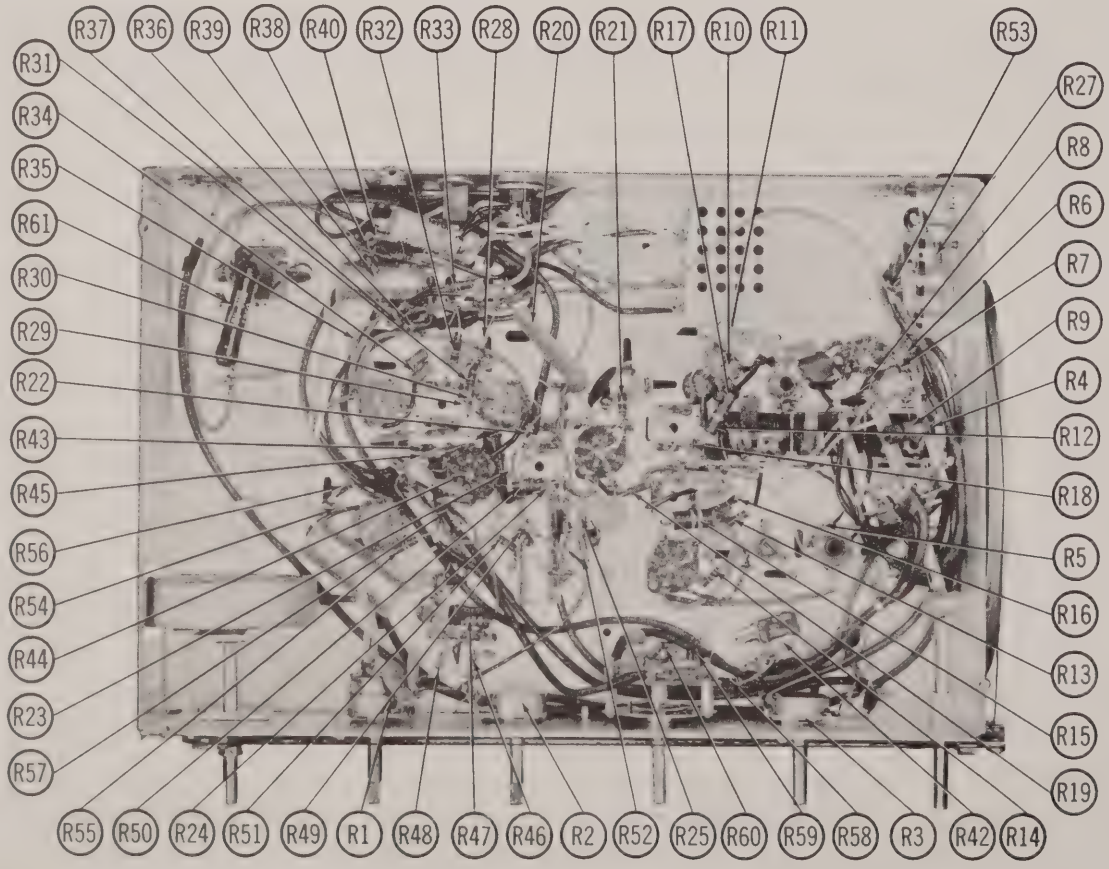
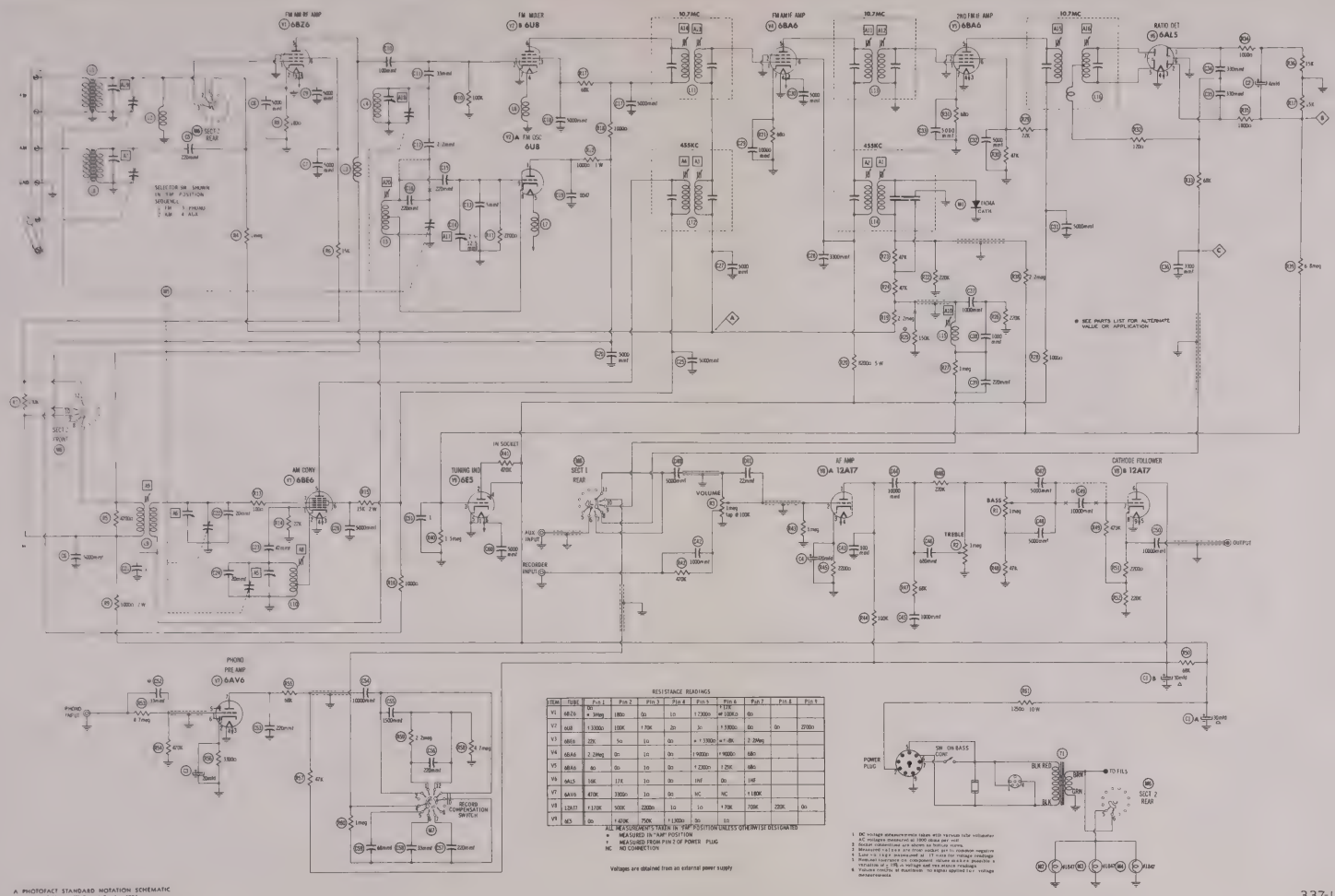


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	DC * 1Meg	180Ω	0Ω	1Ω	↑ 330Ω	↑ 100KΩ	0Ω		
V2	6U8	↑ 330Ω	100K	↑ 70K	2Ω	1Ω	↑ 330Ω	0Ω	0Ω	270Ω
V3	6BA6	22K	5Ω	1Ω	0Ω	∞ ↑ 330Ω	∞ 1.4K	2.2Meg		
V4	6BA6	2.2Meg	0Ω	1Ω	0Ω	↑ 900Ω	↑ 900Ω	68Ω		
V5	6BA6	8Ω	0Ω	1Ω	0Ω	↑ 230Ω	↑ 25K	68Ω		
V6	6AL5	56K	17K	1Ω	0Ω	1MF	0Ω	1MF		
V7	6AV6	470K	330Ω	1Ω	0Ω	NC	NC	↑ 180K		
V8	12AT7	↑ 170K	100K	220Ω	1Ω	1Ω	↑ 70K	70K	220K	0Ω
V9	6E5	0Ω	↑ 470K	750K	↑ 1300Ω	0Ω	1Ω			

ALL MEASUREMENTS TAKEN IN "AM" POSITION UNLESS OTHERWISE DESIGNATED
* MEASURED IN "AM" POSITION
↑ MEASURED FROM PIN 2 OF POWER PLUG
NC NO CONNECTION

Voltages are obtained from an external power supply

1. DC voltage measurements taken with vacuum tube voltmeter.
2. AC voltages measured at 1000 cycles per volt.
3. Socket connections are shown as bottom views.
4. Measured values are from socket pin to chassis negative.
5. Line voltage measured at 117 volts for voltage readings.
6. Resistance measurements are made with line cord disconnected & rotation of ± 10% in voltage will not affect readings.
7. Values may be of maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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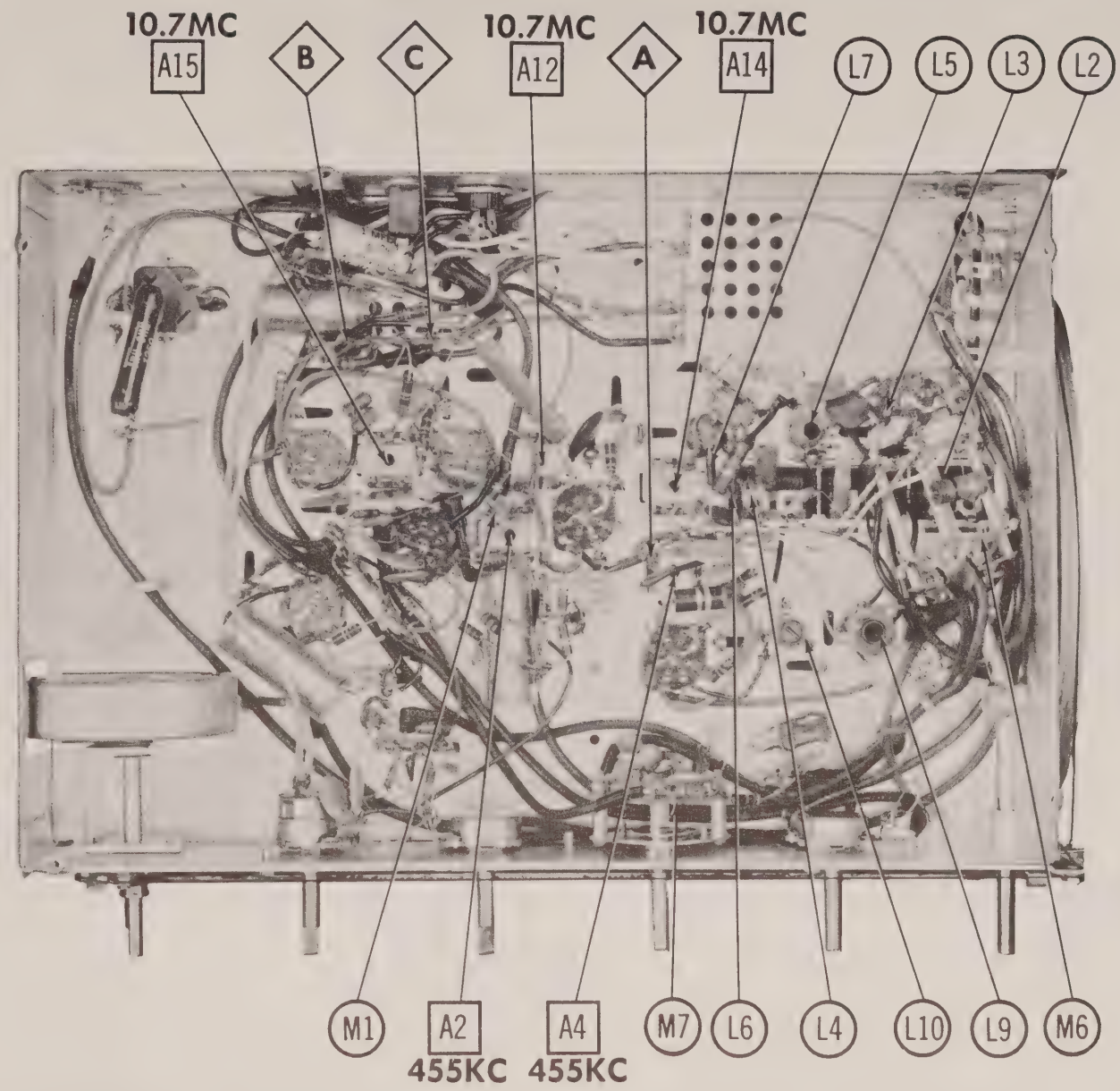
337-11



CHASSIS BOTTOM VIEW INDUCTOR AND ALIGNMENT IDENTIFICATION

MAGNAVOX
CHASSIS CR-723

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C51	.1	200	250202-13	P288N-1	DF-104	CUB2P1		PT401	2TM-P1	
C52	33		250218-21	N750-DI33	TCN-33	N029	N750K-330		5TCU-Q33	Note 2
C53	220		250218-5	DI-00022	D6-221	G051	811-221	UC-5322	5GA-T22	
C54	10000		250218-19	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C55	1500		250218-18	DI-0015	DD-152	K071	801-0015	UC-5215	5GA-D15	
C56	220		250218-5	DI-00022	DD-221	G051	811-221	UC-5322	5GA-T22	
C57	220		250218-5	DI-00022	DD-221	G051	811-221	UC-5322	5GA-T22	
C58	33		250218-21	N750-DI33	TCN-33	N029	N750K-330		5TCU-Q33	
C59	68		250218-7	N750-DI68	TCN-68	N038	N750L-680		5TCU-Q68	
C60	5000		250175-1	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	

Note 1. Not used in some versions.
Note 2. Chassis CR-726 uses 47MMF (part #250218-17)

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MAGNAVOX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	220073-20	AB-70	A47-1Meg-Z	Q13-137	U53	Bass
B	Shaft		Not Req.	AK-3	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	KB-1	SWE-12	76-1	U8-26	Attach to R1A
R2A	1Meg	½	220072-29	B-70	A47-1Meg-S	Q13-137	U53	Treble
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
R3A	1Meg	½	220074-11	BT-7417	A47F3-1Meg	Q18-137X	UT-440	Volume, tapped @ 100K
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA MAGNAVOX PART No.	IRC PART No.	NOTES
R4	1Meg		230104-98	BTS-1Meg	
R5	4700Ω		230104-70	BTS-4700	
R6	15K		230104-76	BTS-15K	
R7	100K		230104-86	BTS-100K	
R8	180Ω		230104-53	BTS-180	
R9	1000Ω	2	230096-62	BTB-1000	
R10	100K		230104-86	BTS-100K	
R11	2700Ω		230104-67	BTS-2700	
R12	1000Ω	1	230105-62	BTA-1000	
R13	100Ω		230104-50	BTS-100	
R14	22K		230104-78	BTS-22K	
R15	15K	2	230096-76	BTB-15K	
R16	1000Ω		230104-62	BTS-1000	
R17	68K		230104-84	BTS-68K	
R18	1000Ω		230104-62	BTS-1000	
R19	2.2Meg		230104-102	BTS-2.2Meg	
R20	8200Ω	5	240071-13	PW7-8200	
R21	68Ω		230104-48	BTS-68	
R22	220K		230104-90	BTS-220K	
R23	47K		230104-82	BTS-47K	
R24	47K		230104-82	BTS-47K	
R25	150K			BTS-150K	Note 1
R26	220K		230104-90	BTS-220K	
R27	1Meg		230104-98	BTS-1Meg	
R28	1000Ω		230104-62	BTS-1000	
R29	22K		230104-78	BTS-22K	
R30	47K		230104-82	BTS-47K	
R31	68Ω		230104-48	BTS-68	
R32	120Ω		230104-51	BTS-120	
R33	68K		230104-84	BTS-68K	
R34	1000Ω		230104-62	BTS-1000	
R35	1800Ω		230104-65	BTS-1800	
R36	15K		230104-76	BTS-15K	
R37	15K		230104-76	BTS-15K	
R38	2.2Meg		230104-102	BTS-2.2Meg	
R39	6.8Meg		230104-108	BTS-6.8Meg	
R40	1.5Meg		230104-100	BTS-1.5Meg	
R41	470K		230104-94	BTS-470K	
R42	470K		230104-94	BTS-470K	
R43	1Meg		230104-98	BTS-1Meg	
R44	100K		230104-86	BTS-100K	
R45	2200Ω		230104-66	BTS-2200	
R46	220K		230104-90	BTS-220K	
R47	68K		230104-84	BTS-68K	
R48	47K		230104-82	BTS-47K	
R49	470K		230104-94	BTS-470K	
R50	68K		230104-84	BTS-68K	
R51	2200Ω		230104-66	BTS-2200	
R52	220K		230104-90	BTS-220K	
R53	4.7Meg		230104-106	BTS-4.7Meg	
R54	470K		230104-94	BTS-470K	
R55	68K		230104-84	BTS-68K	
R56	3300Ω		230104-68	BTS-3300	
R57	47K		230104-82	BTS-47K	
R58	4.7Meg		230104-106	BTS-4.7Meg	
R59	2.2Meg		230104-102	BTS-2.2Meg	
R60	1Meg		230104-98	BTS-1Meg	
R61	1250	10	240021-45	1 3/4A-1250	

Note 1. Not used in some versions.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (FILAMENT)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .17A	6.3VAC @ 2.6A			320258-1	F5512				

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA MAGNAVOX PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	FM Ant. Trans.	.1ΩCT	0Ω	360491-2				
L2	FM Ant. Coil	0Ω		360629-1				
L3	RF Choke	.2Ω		360522-9	19-1002		4606	2 Microhenries
L4	FM RF Coil	0Ω		360629-1				
L5	FM Osc. Coil	0Ω		360628-1				Tapped
L6	Fil. Choke	.2Ω		360522-9	19-1002		4606	2 Microhenries
L7	Fil. Choke	.2Ω		360522-9	19-1002		4606	2 Microhenries
L8	AM Loop Stick	0Ω	.5Ω	460894-1				
L9	AM RF Coil	22Ω	3.2Ω	360348-2			A-5495-RF	
L10	AM Osc. Coil	4.5Ω		360407-2	14-1033			Tapped @ .4Ω
L11	1st. FM IF	.6Ω	.6Ω	360626-1	16-3487	FM-254	1463	
L12	1st. AM IF	16Ω	16Ω	360611-1	16-6758	BC-352	12-C1	
L13	2nd. FM IF	.6Ω	.6Ω	360626-1	16-3487	FM-254	1463	
L14	2nd. AM IF	26Ω	26Ω	360625-1	16-6770	BC-355	12-C6	
L15	10KC Filter	450Ω		360621-1				
L16	Ratio Det.	3.6Ω	1.2ΩCT	360627-1	17-3498	FM-255	1465	Tertiary winding-.4Ω

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA MAGNAVOX PART No.	REPLACEMENT DATA SYLVANIA PART No.	NOTES
M1	1N34A	530030-2	1N34A	Audio Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M2	Dial Light	180161-17	#1847
M3	Dial Light	180161-17	#1847
M4	Dial Light	180161-17	#1847
M5	Tuning Cap.	260135-1	6 Gang
M6	Switch	160255-1	Selector (Rotary, wafer type)
M7	Switch	160252-3	Phono compensation (2 pole - 4 position, rotary, wafer type)
	Dial Glass	150426-1	
	Dial Pointer	102449-1	

RETMA MEMBER
RADIO-ELECTRONICS-TELEVISION MANUFACTURERS ASSOCIATION

PROPERTY OF
L. F. BLANKENSHIP
3936 MAPLE ST.
DENVER, COLORADO

MIRACORD
MODEL XA-100

MIRACORD
MODEL XA-100

Figure 1

GENERAL INFORMATION

The Miracord XA-100 Record Changer is designed to play in automatic sequence a stack of records and shut off after playing of the last record. Also can be used manually.

As many as eight 12", ten 10", or any assortment of 10" and 12" records (providing they are of the same speed and same type of groove) may be intermixed in any order. The stack of records should not exceed the limit being indicated by three white marks at the top end of the spindle.

A stack of ten 7", 45 R. P. M. records (with the use of a "45" R. P. M. automatic spindle which is available as an accessory) will also play and be automatically changed on this machine.

After the last record of a stack has been played the pick-up arm is returned to the rest post and automatically shuts off the changer.

This record changer must not be connected to any other than A. C. supply. It is adapted for 110 or 220 volt A. C. supply and is adjusted to be operated on 110 volts when leaving the factory.

AUDIOGERSH CORPORATION

514 BROADWAY, NEW YORK, N.Y.

EXCLUSIVE DISTRIBUTORS IN THE U. S. FOR ELAC RECORD PLAYERS

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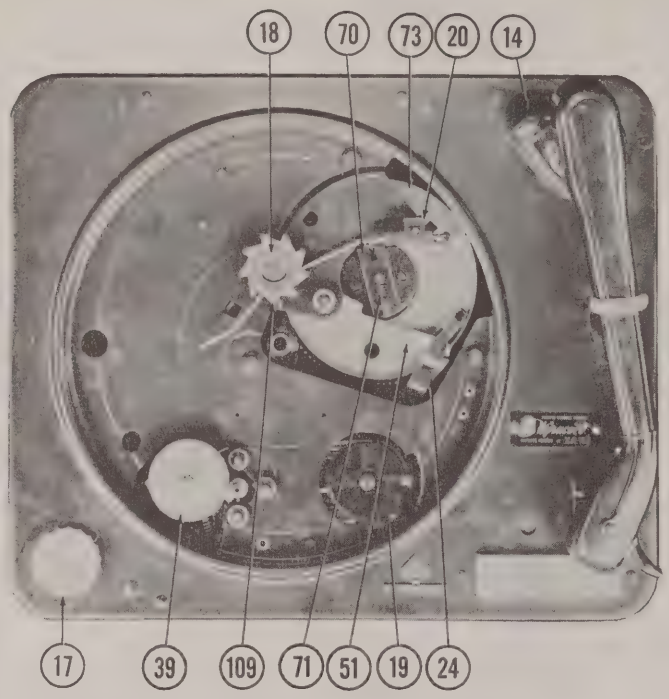

Figure 2

FUNCTIONS OF THE CONTROLS

"When using the MIRACORD as a full automatic unit and to take advantage of all the functions that the changer can perform, you must have two or more records on the Magic Wand spindle when you set it in operation."

Start Button: Depressing this button starts the changer into automatic operation. A record may also be rejected at any time by pressing this button.

Stop Button:

If at any time while the Miracord is playing you wish to stop the unit, push the "Stop" button. The tone arm will then pick up and go to rest position, shutting off the changer.

Pause Button: Through the use of this button the changer can automatically be set for a time lapse between the changing of each record. The interval position is indicated at a small window directly above the "Pause" button and the figures as shown in the chart below allow settings anywhere from 5 seconds to 5 minutes.

	SETTINGS				
R. P. M.	0	1	2	3	4
78	5sec.	35sec.	70sec.	105sec.	140sec.
45	9sec.	60sec.	120sec.	180sec.	240sec.
33 1/3	12sec.	82sec.	164sec.	246sec.	328sec.

Repeat-

When using the Repet mechanism you must have two or more records on the Magic Wand spindle. The Repeat button can be used in two ways:

1. By pressing just the "Repeat" button the tone arm will continue to the end of the record, and then repeat the same record over.

2. By pressing both the "Start" and "Repeat" button the tone arm will lift and repeat the same record.

Filter Button: By pushing the Filter Button forward, you limit the reproduction of the higher frequencies, thereby reducing the scratching noise that sometimes appears when playing old records.

Speed Control Knob: The speed control knob determines the turntable speed and automatically sets the mechanism for the 7" or 10" set-down.

OPERATING INSTRUCTIONS

Loading-

Place a stack of eight 12" or ten 10" records (or a corresponding mixture of both) or ten 7" records on the spindle and gently lower to the three protruding fingers on the spindle.

Note: When intermixing records, they must be of the same speed and same type of groove.

Starting-

To start the machine, after checking that the stylus and speed controls are in the position corresponding to the type records to be played, press the "Start" button, hold momentarily, and release. The changer will operate automatically until the last record has been played, at which time, the pick-up arm is returned to its rest and the supply to the motor is switched off.

Rejecting-

A record may be rejected at any time by depressing the "Start" button.

Using Miracord XA 100 As Manual Record Player-

Instead of the changer spindle, insert the "Single Play Spindle" into the center hole of the turntable and place the record to be played on the turntable. When playing a 12" record, its edge will automatically touch

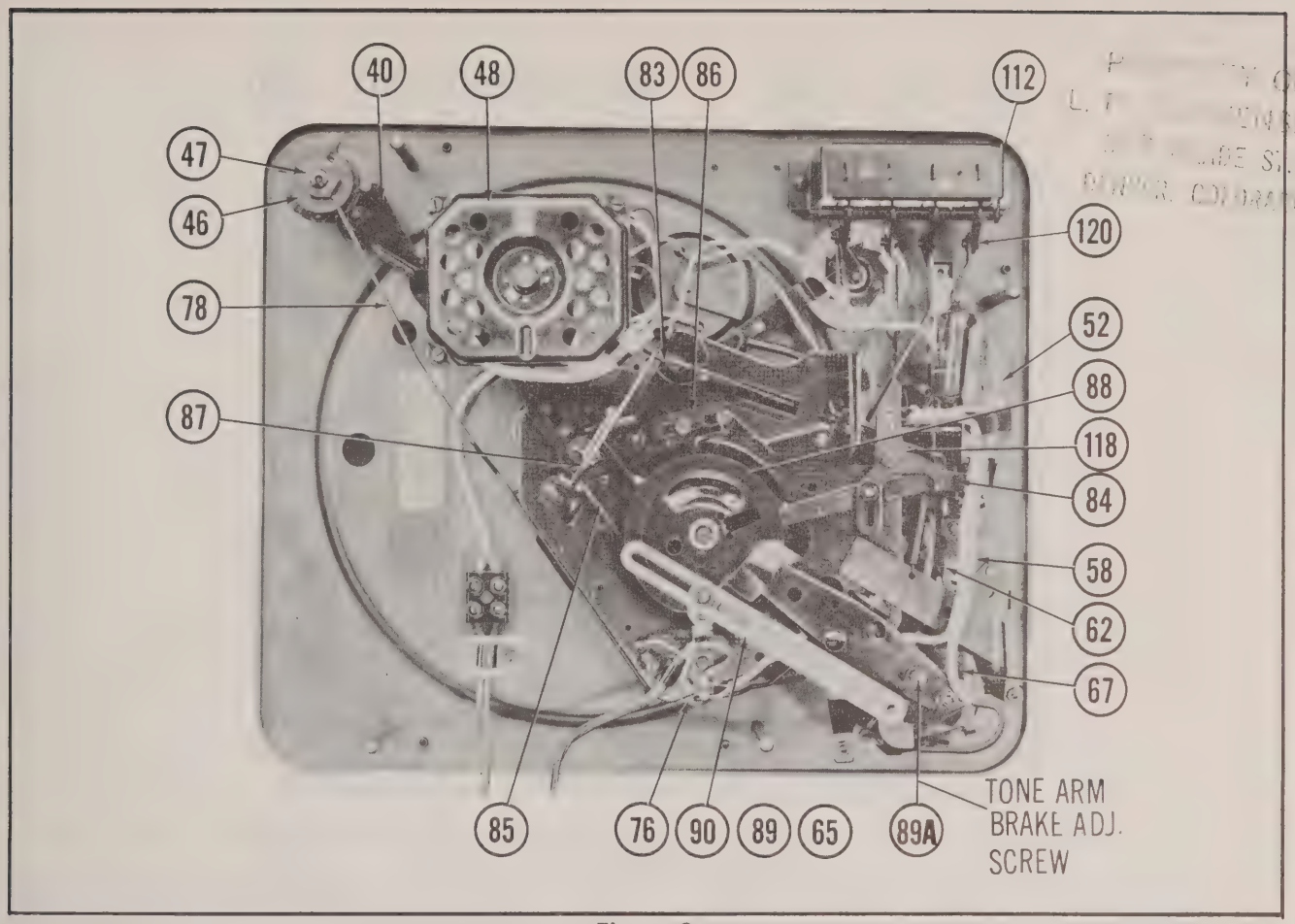

Figure 3

scanning lever (14) which sets the mechanism for the 12" set-down position.

To play a 7" record with a 1 1/2" center hole , place the "Puck" on the "Single Play Spindle" engaging it in the three humps on the rubber turntable mat.

Operate the changer as previously described and when the record has been played the pick-up arm will return to its rest and the instrument will shut off automatically.

Continuous Repetition-

The changer will automatically keep playing the same record when the player spindle is insert inversely. The changer is switched off by placing the tone arm back on its support by hand. It is not possible, however, to play any 12" record continuously, only the 10" record. It is possible, however, to use the pause mechanism to select an interval between the repetitions. "When using the MIRACORD for continuous repeat you must start the unit by using the Start Button. "

CHANGE CYCLE

It is recommended that the change cycle operation be observed while rotating the turntable by hand . The action described below can then be readily followed and the function of each part more easily understood.

Process To Start Record Changing: The process of record changing is initiated via the starting lever (84) which is actuated when the "Start" button is depressed , or by weighted segment (62) when the stylus moves into the trip groove after the record has been played to the finish.

Drive: The changer is driven by a asynchronous A. C. motor (48), on the shaft of which a 3-step drive pulley is mounted. The idler wheel (39) is adjusted to ride on different steps of the drive pulley by the idler pivot lever (40) and the speed change worm (42) when the speed control knob (17) is actuated.

The idler wheel (39) is arranged between the motor drive pulley and turntable rim and is held in firm contact with these parts by idler tension spring (23) to drive the turntable at a constant speed.

To prevent flat spots from developing on the idler wheel (39), when the changer is not in use, it is pulled away from the motor pulley when speed control knob (17) is placed in one of the "o" positions.

Functions Of Cycling Mechanism: Depressing the "Start" button causes the start link (35) to simultaneously actuate line switch (52) and start lever (84). As start lever (84) is actuated it contacts and moves the cycle starting catch (81) so as to move the rubber bumper on the end of catch (81) into contact with the lower driving surface on the turntable hub. The contact between the rubber bumper on cycle starting catch (81) and the turntable hub gives the necessary push for the teeth in cogwheel (80) to engage the teeth in the turntable hub, thus, causing cogwheel (80) and cam disk (88) to rotate. As cam disk (88) starts to rotate the tone arm control lever (89) rides up an incline on the outer edge of the cam disk to raise the tone arm. At this time, an eccentric mounted pin on cam disk (88) engages the tone arm control coupling rod (90), which in turn, actuates the tone arm actuating lever (65) to move the tone arm out away from the turntable.

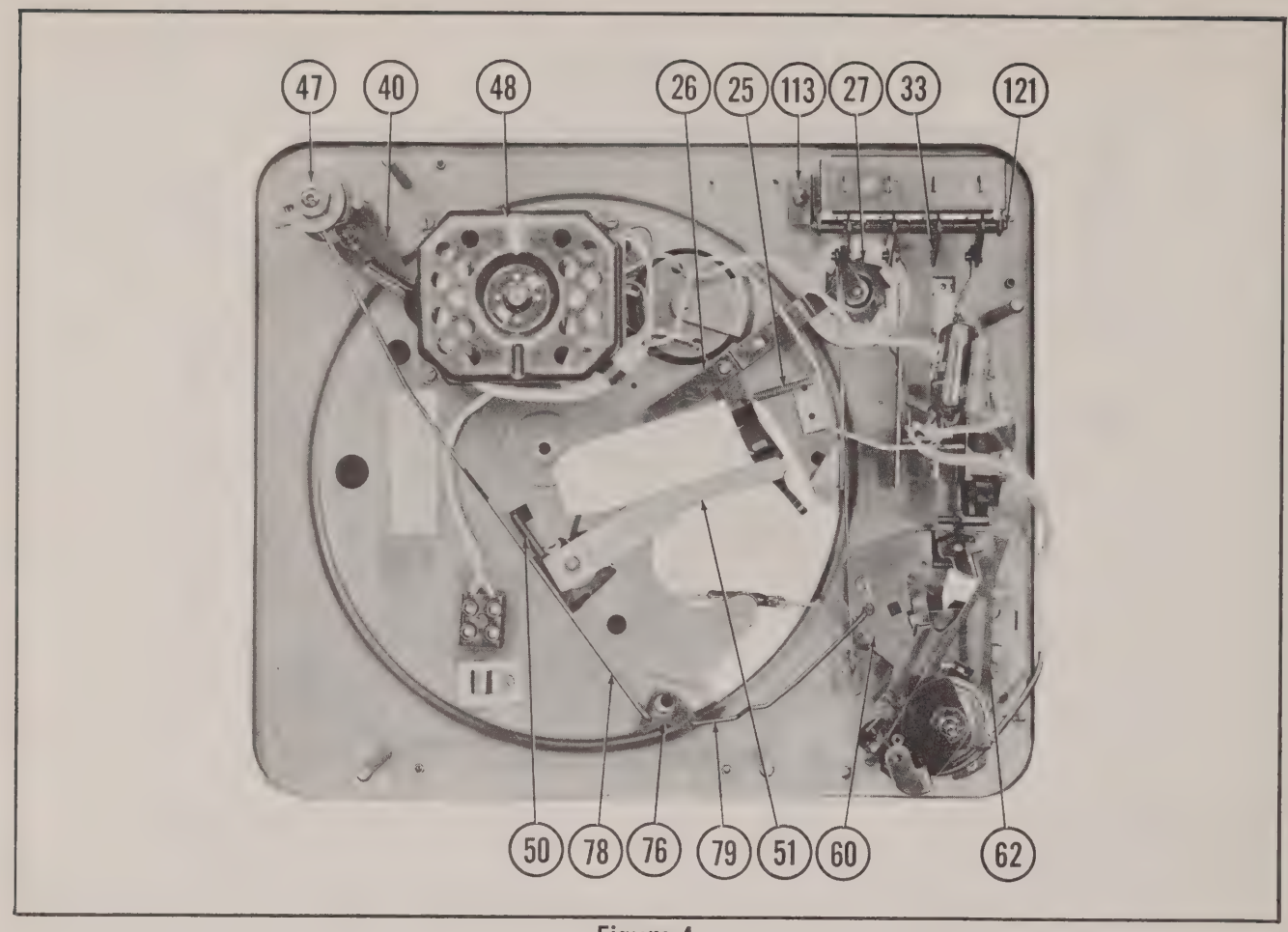

Figure 4

When the tone arm has reached its farthest outward excursion the cam disk (88), by reason of its contour, contacts and moves the spindle actuating lever (85) forward far enough to engage with the bottom end of the record spindle (1). The adjustment screw on the rear of the spindle actuating lever (85) now rides up the inclined cam surface on cam disk (88) and in so doing pivots the front of spindle actuating lever (85) downward to actuate the record spindle (1). This drops the bottom record of a stack, resting on the record spindle, to the turntable.

The tone arm adjusts itself to the size records being changed by the stop dog plate (60) which is provided with two levers. One is the 7" slide plate (57) which controls the 7" and 10" set-down positions and the other is the 12" stop dog (63) which controls the 12" set-down position. 7" slide lever (57) is moved into position for 7" records via a rod system (78 and 79) when the speed control is placed in the 45" position.

Tracer lever (58), which is coupled directly to the tone arm support mechanism and therefore moves in unison with the tone arm, directs the in-movement of the tone arm to one of the three set-down positions.

When 7" records are being changed and the changer is in the 45 R. P. M. speed position, the turned down nose on tracer lever (58) slides up the incline and over the top of 7" slide lever (57). After sliding over the top of the 7" slide lever the turned down nose on tracer lever (58) drops into a square hole in the stop dog plate (60), stopping the inward travel of the tone arm with the stylus positioned directly over the lead-in groove of the 7" record.

When 10" records are being changed and the changer is in the "33" or "78" speed position, the 7" slide lever (57) is pivoted toward the front of the changer. Consequently, the tracer lever (58) fails to make contact with the 7" slide lever (57) as the tone arm moves inward. The turned down nose on tracer lever (58) moves behind the 7" slide lever (57) and comes to rest against the stop dog plate (60). This positions the stylus directly above the lead-in groove of the 10" record.

When a 12" record drops to the turntable it strikes the spring-loaded scanning lever (14), which in turn, pushes the 12" stop dog (63) in front of the turned down nose on the tracer lever (58). As the tone arm moves in toward the record the turned down nose on the tracer lever (58) comes to rest against the 12" stop dog, stopping the inward movement of the tone arm, which positions the stylus directly above the lead-in groove of the 12" record.

At this time, the tone arm control lever (89) rides down the cam surface on the outer edge of cam disk (88) and lowers the tone arm onto the record. This same action raises the tracer lever (58) out of engagement with the set-down stop dog that it is engaged with, permitting the tone arm to ride freely across the record.

Cogwheel (80) and cam disk (88) have now completed their rotation and the "open gap" in the cogwheel teeth faces the pinion gear on the turntable hub, thus completing this phase of the change cycle.

As the stylus moves across the record, the weighted segment (62) moves inward with the tone arm

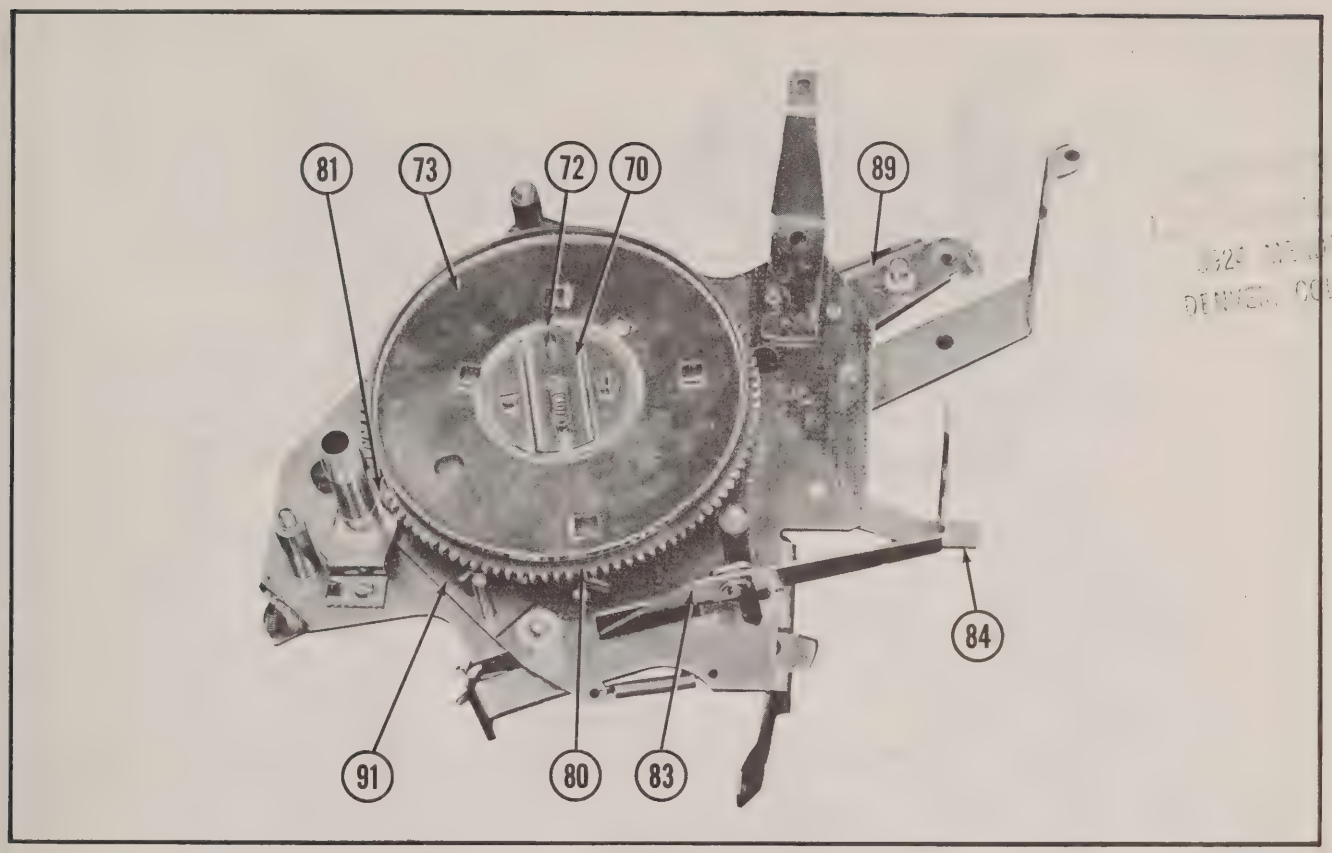

Figure 5

through a friction clutch arrangement. As the tone arm nears the end of a record the weighted segment (62) strikes the cycle starting catch (81) and moves it until the rubber bumper on its end moves to within .016" of the turntable hub. At this time the weighted segment (62) also contacts the recoil lever (20). The pin on the underside of the turntable, located nearest the hub, strikes the recoil lever (20) on each revolution of the turntable and the recoil lever, in turn, strikes and moves the weighted segment (62) back away from the starting catch (81). This action takes place during each revolution of the turntable until the stylus reaches the end of a record, at which time, the stylus enters the lead-out groove and the tone arm accelerates rapidly. This rapid acceleration causes the weighted segment (62) to move far enough and fast enough to push the cycle starting catch (81) and its rubber bumper into contact with the lower driving surface on the turntable hub. The contact between the rubber bumper on cycle starting catch (81) and the turntable hub gives the necessary push for the teeth in cogwheel (80) to engage with the teeth on the turntable hub and thus, start a new change cycle.

Again, the mechanism follows the preceding sequence of cycling and playing the records until the last record of the stack has been played.

Automatic Shut-Off Process: When the last record drops, the three expanding fingers at the top of the record spindle are not restrained by the center hole of a record. This action allows the "wire" at the bottom of the record spindle to be pulled down farther than when records are resting on the spindle. The down-movement of the "wire" on the bottom of the record spindle is transmitted to the ratchet lever (61) by action of the switch-off lever (83) and the shut-off lever (87). When the tone arm swings out, ratchet lever (61) engages with the notch in the front of the tracer lever (58) and restrains the tone arm from moving in over the turntable. At this time, cam disk (88) completes its revolution and lowers the tone arm onto its rest, which, in turn, disconnects the line switch (52).

Functions Of The Pause Mechanism: Pauses are introduced between records only when the pause mechanism is switched on, (positions 1 to 4). This process is carried out by the tooth segment located on the underside of cogwheel (80). This tooth segment is moved inwards, making a gap in the cogwheel teeth (80), by the pause gap actuating lever (91).

Interval disk (73) has four stop dogs on its top side which stop the disk at a certain angle of arc, depending on the position of pause lever (24), which is actuated by the pause push button. When the "pause gap" is open, stopping the rotation of cogwheel (80), rubber cogwheel (18) is pivoted by the pause drive axle lever (51), which, in turn, is pivoted by slide piece (72). This moves the pause drive ring (49), located on the shaft of rubber cogwheel (18), against the rim of interval disk (73).

During each revolution of the turntable the outermost pin on the underside of the turntable strikes and moves rubber cogwheel (18) which causes interval disk (73) to slowly follow the rotation through action of the pause drive ring (49). The interval disk (73) now strikes a catch bolt on cogwheel (80), turns same, thus bridging the "pause gap" permitting the changer to continue on through its cycle.

Functions Of The Repeat Mechanism: When the "Repeat" button is depressed, spindle actuating lever (85) is blocked by the repeat bar (86) resulting in the record spindle (1) not being actuated when the mechanism goes through its cycle. An instant before cam disk (88)

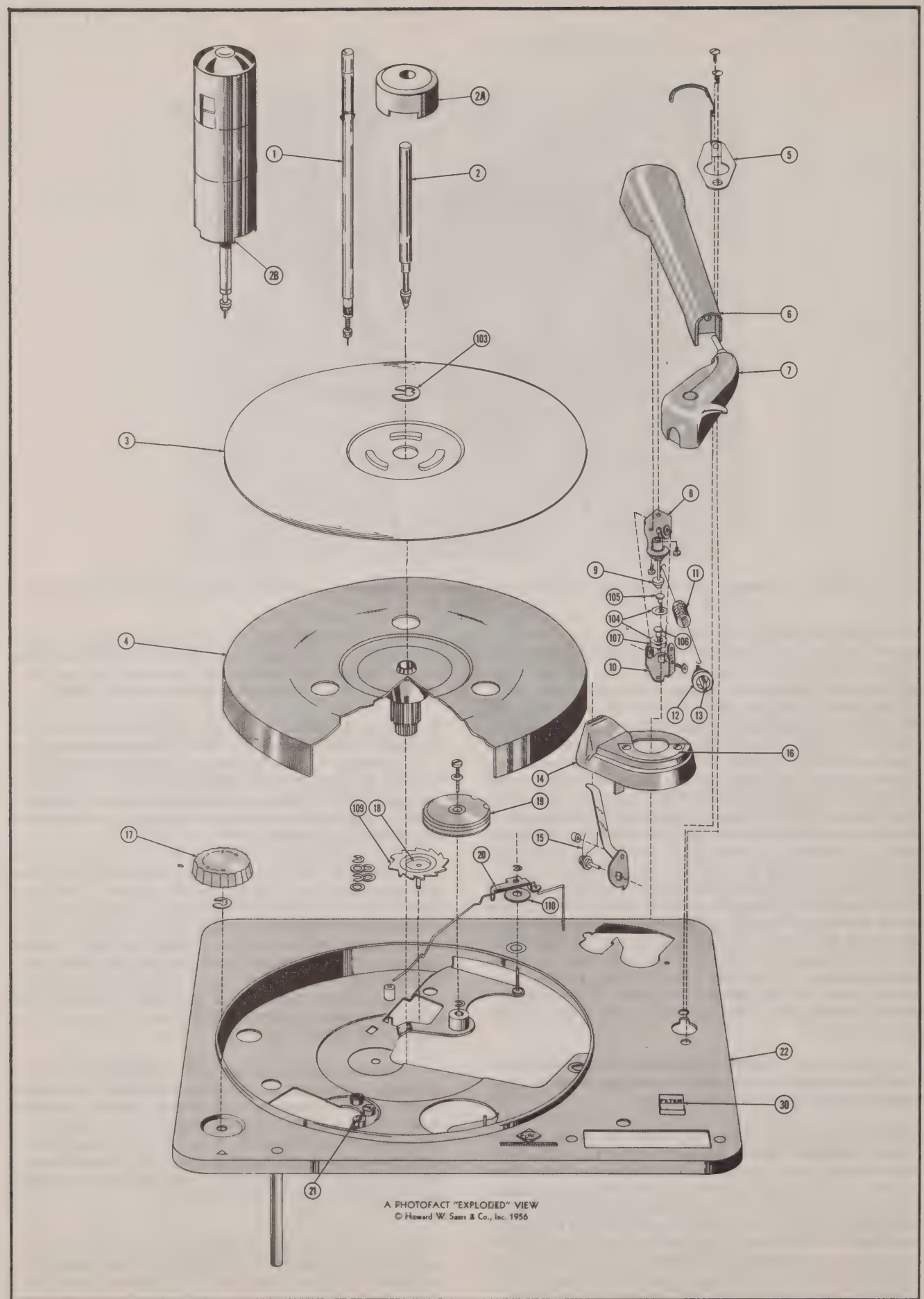

Figure 6A. Exploded View Of Parts Above Baseplate.

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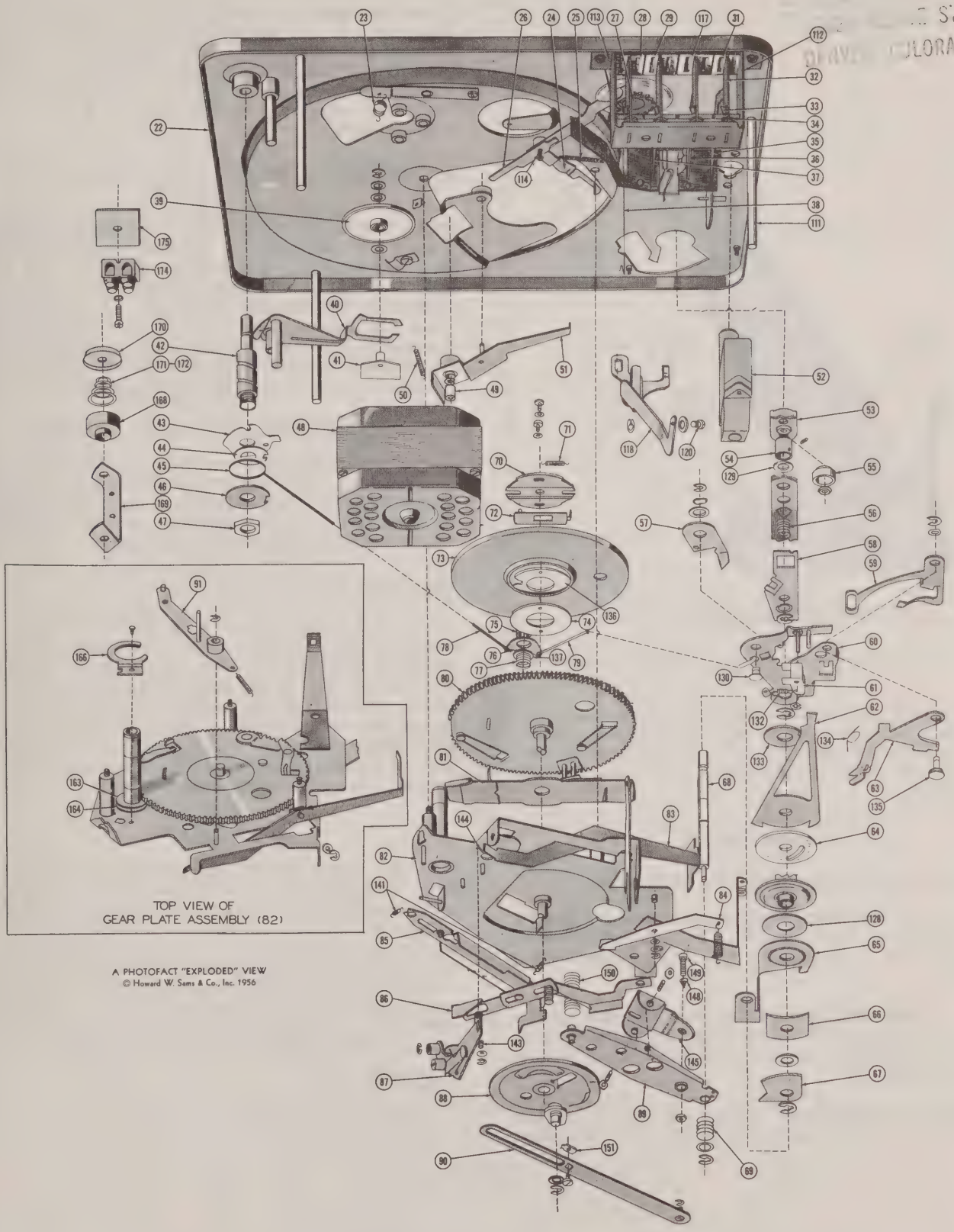

Figure 6B. Exploded View Of Parts Below Baseplate.

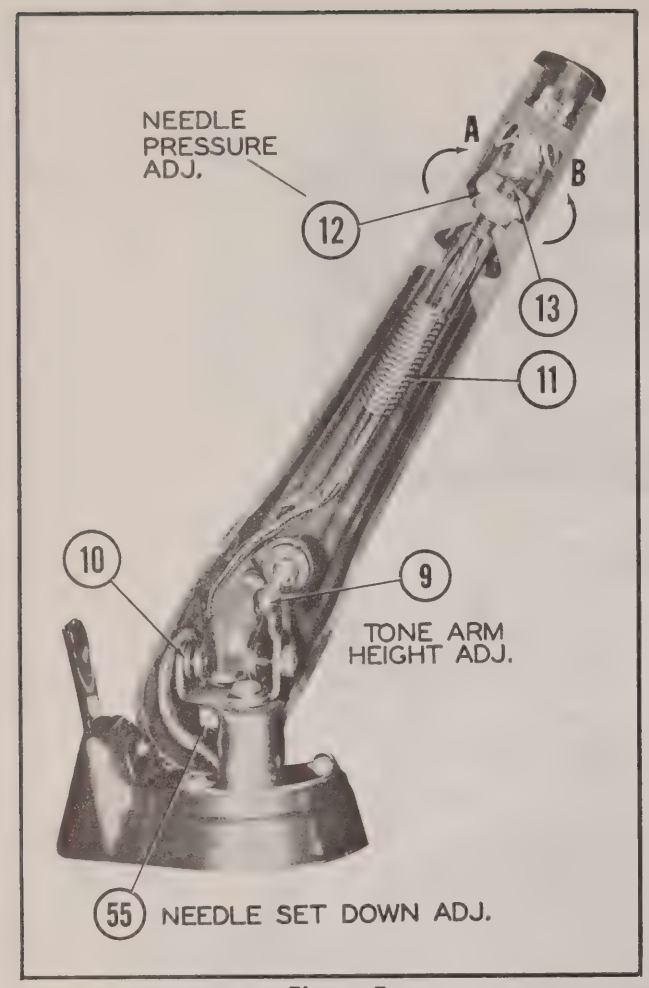

Figure 7

completes its revolution the nose on its outer surface strikes and pushes repeat bar (86) into its normal position. The changer will now continue to change each record in sequence until the "Repeat" button is again depressed.

ADJUSTMENTS

Stylus Pressure Adjustment (Refer To Figure 7)-

The stylus pressure depends upon the data for the cartridge used, however, in consideration of the mechanism of the changer, must not be less than 6.5 grams.

The stylus pressure can be regulated by turning the knurled nut (12). If it is to be measured on the first record being dropped (measuring range between 5 and 15 grams).

Turning into direction a = stylus pressure decreases.
Turning into direction b = stylus pressure increases.

Tone Arm Height Adjustment-(Refer To Figure 7)-

The height to which the tone arm will raise, during change cycle, is adjusted by knurled screw (9). To adjust, cycle changer by hand until the tone arm has moved in over the turntable and while the arm is at maximum height turn screw (9) until the needle point lies 1" above the rubber turntable mat. After this adjustment is made, check to see if the tone arm lands low enough to play a thin record. If not, lower height slightly.

Landing Point - Adjustment - (Refer To Figure 7)-

The tone arm landing point can only be adjusted for all sizes of records in common, since the distances - apart are stereotype. It suffices to adjust the landing point for one size of record by turning the tone arm accordingly in relation to the support. This is done by turning knurled eccentric screw (55). It is advised to check the landing point, particular for 7" records. For playing a 7" record it is required to set the speed control knob on 45 R.P.M., whereas the playing of a 12" record is effected by the scanning lever.

Tone Arm Brake Adjustment-(Refer To Figure 3)-

When the tone arm is in playing position, a small gap should be seen between brake segment (67) and brake adjustment screw (89A), to allow the tone arm to move freely across a record. The gap is adjusted by turning brake adjustment screw (89A).

Idler Wheel (39) Height Adjustment-

Place speed control knob (17) in the "o" position and lift off the turntable. Check to see that idler wheel (39) lies horizontal and that its height is correct. The bottom edge of the idler wheel tire must not be sliding on the next step of the motor pulley. The height can be adjusted by loosening hex. nut (47) and turning speed change worm (42). Then tighten hex. nut (47) well and, if necessary, set knob (17) so that its numerals face the triangular mark on the baseplate.

LUBRICATION

The motor bearings and the idler wheel (39) are amply provided with oil (sinter bushes) for a very long period of operation. Only if record changer is operated without interruption, or in case of troubles, apply oil and grease as indicated on the lubrication diagram. No grease or oil should be applied to the inside of the turntable, to step pulley of the motor (48), the rubber ring of the idler wheel, the ball bearing race of the drive axle (pause mechanism) and the rim of the interval disk (73). Clean with alcohol or acetone.

For Oiling Use:

M: Grease
O: Oil

LUBRICATION DIAGRAMS

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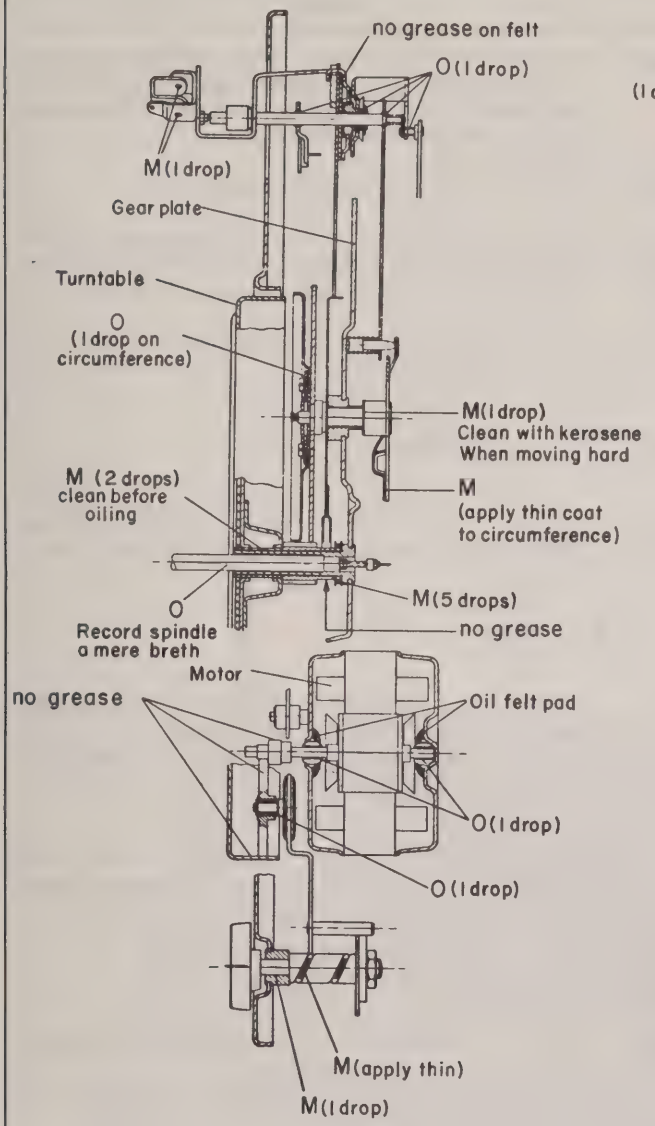

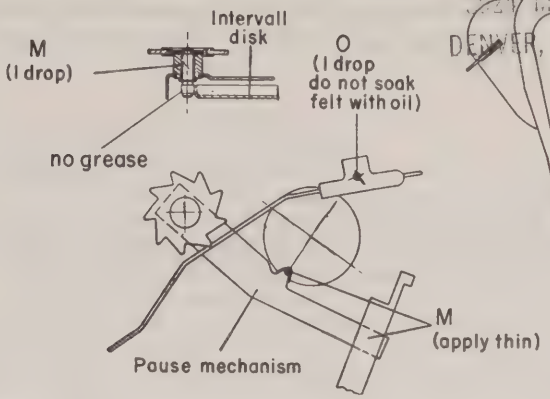

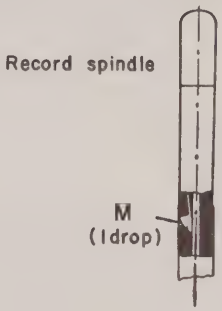

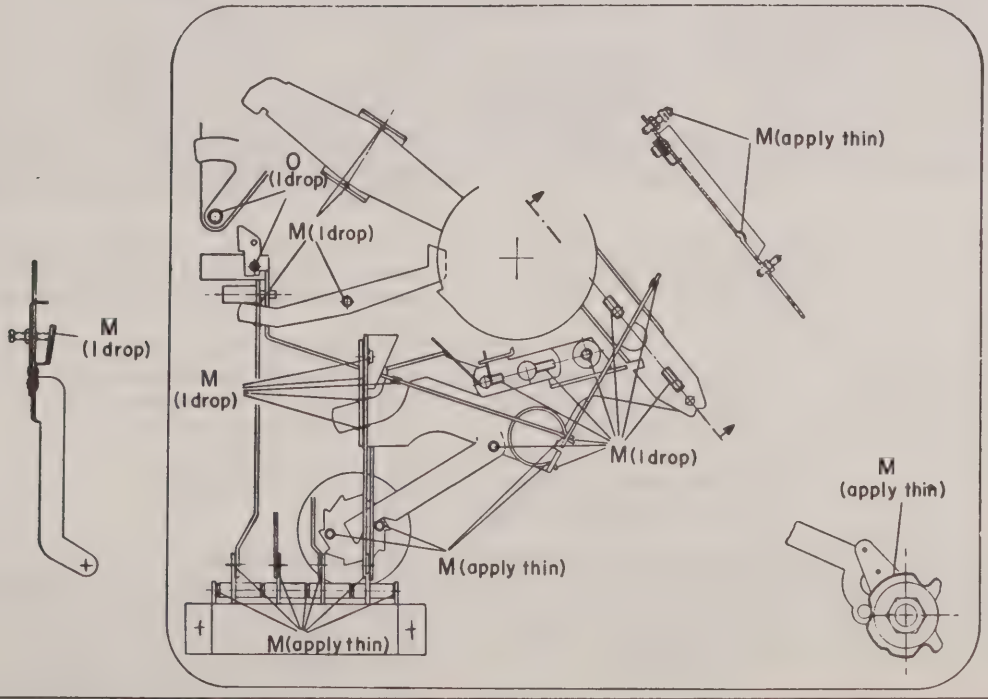

TROUBLE SHOOTING CHART

SYMPTOM	CAUSE	REMEDY
Tone arm lands in wrong place.	1. Controlling elements not free to move.	Check cut-out in wooden mounting base and position of drilled holes with the aid of a template. Lay connecting wires so that they do not come into contact with drive elements.
	2. Dislocated during transport.	See "Tone Arm Set-Down Adjustment".
Changer does not trip when needle reaches end of record.	1. Weighted segment (62) cannot overcome force of recoil lever (20).	Remove turntable and recoil lever (20). Lubricate recoil lever bearing with light oil, (1 drop).
Changer trips before tone arm reaches end of record.	1. Center hole in record too large.	Discard faulty record.
	2. Felt washer (64) dirty, causes weighted segment (62) to bind.	Clean felt washer.
Tone arm lands in 10" position when playing 7" records or lands in 7" position when playing 10" records.	1. Rod connecting lever (76) hangs up on mounting base.	Check cut-out in base and make wider, if necessary.
	2. Rod (78 or 79) bent.	Bend rods so that 7" stop dog (57) is in proper position when 7" records are played.
Tone arm lands in 10" position when playing 12" records.	1. 12" stop dog (63) binding on stop dog plate (60).	Clean 12" stop dog (63) or, if necessary, replace.
Record does not drop.	1. Record spindle stroke too small.	Adjust screw on rear of spindle actuating lever (85) to lengthen spindle stroke.
	2. Record spindle jamming.	Replace spindle.
	3. Repeat bar (86) jamming.	Clean foreign matter from bar (86) and oil pivot points.
Reproduction poor.	1. Records slipping, warped.	Discard records.
	2. Pick-up cartridge or stylus defective.	Replace cartridge or stylus.
	3. Turntable binding.	Remove turntable, clean hub and shaft, lubricate inside of turntable hub with light machine oil. Keep the outside surface of the turntable hub free from oil.
Rumbling noise when turntable revolves.	1. Idler wheel tire(39)dirty or dented.	Remove turntable and clean idler wheel tire, motor pulley, and inside of turntable rim with a petroleum solvent.
Changer does not shut off after last record has been played.	1. Wire on bottom of record spindle does not actuate levers (83) and (87).	Adjust eccentric screw on end of shut-off lever (87) so that wire on bottom of record spindle actuates levers (83) and (87).
	2. Protruding wire at bottom of record spindle broken.	Replace record spindle.
	3. Line switch (52) defective.	Replace line switch.
Changer shuts off before all records have dropped from record spindle.	1. Eccentric screw on end of shut-off lever (87) improperly adjusted.	Adjust eccentric screw on end of shut-off lever (87) so that levers (83) and (87) are actuated, by wire on bottom of record spindle, only when the last record of a stack drops from the turntable.

TROUBLE SHOOTING CHART – CON'T.

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SYMPTOM	CAUSE	REMEDY
Turntable does not revolve when "Start" button is depressed.	1. No current at motor.	Check that current is reaching A.C. leads of changer.
	2. Line switch (52) defective.	Replace line switch.
	3. Motor defective.	Remove the turntable and allow motor to operate without load. If current is reaching motor and motor shaft does not rotate, the motor is defective. Repair or replace.
		Check all wiring and soldered terminals in the changer.

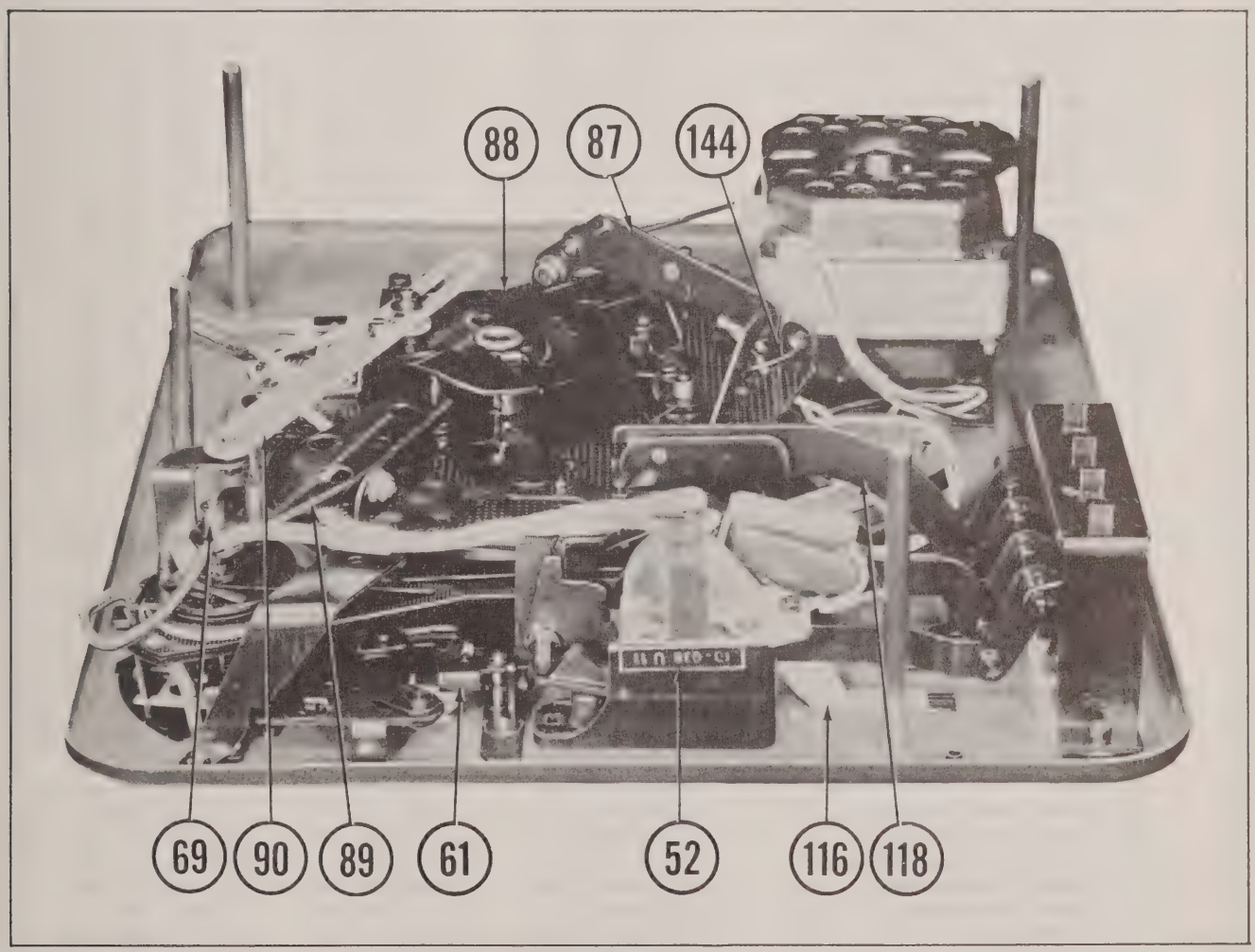

Figure 8

Explanation for Symbols used in Spare Part List for XA 100 (2-228 U)

+	These parts are fully exchangeable with the old parts which are not listed any more.	x	Both parts marked are exchangeable against the old parts only when both parts are exchanged.
++	These parts are the replacements for the old types and can be used in connection with the other indicated new parts.	0	These parts are used only for the new 5-push button units.

SPARE PART LIST FOR XA 100

REF. NO.	Description	XA 100 up to Serial No. 204 800 Order No.	XA 100 from Serial No. 204 801 to 213 900 Order No.	XA 100 5 Push Buttons from Serial No 213 901 Order No.
1	Record spindle SA 7 B	10-024 B	10-024 B	10-024 B
2	Single play spindle	10-028	10-028	10-028
2A	Adaptor	10-056	10-056	10-056
2B	Record spindle SA 38 C	10-025 C	10-025 C	10-025 C
3	Rubber mat	10-027-100	10-027-100	10-027-100
4	Turntable, compl.	10-038 U50	10-038 U50	10-038 U50
5	Tone arm bracket	10-038 U23	10-038 U23	10-038 U23
6	Pick-up arm	10-102 A	10-102 A	10-102 A
7	Plug-in head	10-101 A	10-101 A	10-101 A
8	Tone arm mtg. bracket bridge	10-038-78	10-038-78	10-038-78
9	Height adjustment screw	10-027-189	10-027-189	10-027-189
10	Bracket, compl.	10-038 U8	10-038 U8	10-038 U8
11	Tension spring	10-038-26	10-038-26	10-038-26
12	Needle pressure adj. nut	10-038-29	10-038-29	10-038-29
13	Headless screw	10-038-28	10-038-28	10-038-28
14	Scanning lever, compl. w. housing	10-027 U18	10-027 U18	10-027 U18
15	Helical twist spring	10-027-82	10-027-82	10-027-82
16	Leveling piece	10-027-84	10-027-84	10-027-84
17	Speed control knob	10-027-21	10-027-21	10-027-21
18	Rubber cogwheel, compl.	10-027 U6	10-027 U6	10-027 U6
19	Voltage selector	90-182 A +	90-182 A	90-182 A
20	Recoil lever	10-027 U7	10-027 U7	10-027 U7
21	Rubber gasket for suspension of motor	10-038-51	10-038-51	10-038-51
22	Chassis, complete	10-038 U1	10-038 U1	10-038 U69 0
23	Tension spring	10-016-36	10-016-36	10-016-36
24	Switch lever	10-038 U4	10-038-86 x	10-038-86
25	Tension spring	10-038-73	10-038-73	10-038-73
26	Pause gap actuating lever	10-038-10	10-038-10	10-038-10
27	Ratchet wheel and scale	10-027 U3	10-027 U3	10-027 U3
28	Repeat button	10-027 U8	obsolete, use parts	
29	Pause button	10-027 U9	28 ++, 29 ++, 30 ++	
30	Filter button	10-027 U10	respectively 31 ++	
31	Start button	10-027 U11	in connection with part 32	
28 ++	Repeat button	10-027-280	10-027-280	10-027-280
29 ++	Pause button	10-027-281	10-027-281	10-027-281
30 ++	Filter button	10-027-285	10-027-285	10-027-310 0
31 ++	Start button	10-027-283	10-027-283	10-027-283
32	Lever	—	10-027-284	10-027-284
33	Angular lever	10-027 U12	10-027 U12	10-027 U12
34	Compression spring	10-027-57	10-027-57	10-027-57
35	Lever	10-027 U16	10-027 U16	10-027 U95 0
36	Insulating bar	10-027 U50	10-027 U50	10-027 U83 0
37	Lever	10-027 U15	10-027 U15	10-027 U15
38	Rod	10-027-215	10-027-215	10-027-215
39	Idler wheel, compl.	10-016 U8	10-016 U8	10-016 U8
40	Idler pivot lever	10-038 U3	10-038 U3	10-038 U3
41	Idler wheel mtg. plate	10-038 U21	10-038 U21	10-038 U21
42	Speed change worm	10-027-341 +	10-027-341	10-027-341
43	Speed change cam	10-027-22	10-027-22	10-027-22
44 ++	Eccentric	10-027-342	10-027-342	10-027-342
45 ++	Rod	10-027-340	10-027-340	10-027-340
46 ++	Washer	10-027-343	10-027-343	10-027-343
47	Hexagonheadnut			
48	Motor MOW 8	10-036 A	10-036 A	10-036 A
49	Pause drive ring	10-027-40	10-027-40	10-027-40
50	Tension spring	10-012-40	10-012-40	10-012-40
51	Pause drive axle lever	10-038 U5	10-038 U5	10-038 U5
52	Line switch	10-038 U11	10-038 U11	10-038 U11
53	Tone arm support	10-038 U7	10-038 U7	10-038 U7
54	Setting ring	10-038-55	10-038-55	10-038-55
55	Knurled set-down adj. nut	10-038-23	10-038-23	10-038-23
56	Compression spring	1-02301-144	1-02301-144	1-02301-144
57	7" Slide lever	10-027-211	10-027-211	10-027-211

PROPERTY OF L. F. WAKEFIELD 3084 ARAPAHOE DENVER, COLORADO

REF. NO.	Description	Belongs to	XA 100 up to Serial No. 204 800 Order No.	XA 100 from Serial No. 204 801 to 213 900 Order No.	XA 100 5 Push Buttons from Serial No. 213 901 Order No.
58	Tracer lever		10-027 U47	10-027 U47	10-027 U47
59	Repeat lever		10-027-207	10-027-207	10-027-207
60	Stop dog plate, compl.		10-027 U44	10-027 U44	10-027 U44
61	Ratchet lever		10-027-213	10-027-213	10-027-213
62	Weighted segment		10-027 U22	10-027 U22	10-027 U22
63	12" Stop dog		10-027-210	10-027-210	10-027-210
64	Felt washer		10-016-14	10-016-14	10-016-14
65	Tone arm actuating lever		10-027-92	10-027-92	10-027-92
66	Spring washer		10-027-93	10-027-93	10-027-93
67	Brake segment		10-027-72	10-027-72	10-027-72
68	Tone arm support rod		10-038-16	10-038-16	10-038-16
69	Compression spring		10-025-22	10-025-22	10-025-22
70	Guide disk		10-027-141	10-027-141	10-027-141
71	Slide piece tension spring		10-038-72	10-038-72	10-038-72
72	Slide piece		10-027 U33	10-027 U33	10-027 U33
73	Interval disk		10-027-135	10-038-84 x	10-038-84
74	Triazetatfolie		10-027-125	10-027-125	10-027-125
75	Spacer		10-027-221	10-027-221	10-027-221
76	Rod connecting lever		10-027-220	10-027-220	10-027-220
77	Compression spring		10-027-236	10-027-236	10-027-236
78	See Ref. No. 45				
79	7" Set-down rod		10-027-223	10-027-223	10-027-223
80	Cogwheel				
81	Cycle starting catch				
82	Gear plate				
83	Switch-off lever		10-027-265	10-027-265	10-027-265
84	Start lever		10-038-14	10-038-14	10-038-14
85	Spindle actuating lever		10-027 U35	10-027 U35	10-027 U35
86	Repeat bar, compl.		10-027 U38	10-027 U38	10-027 U38
87	Shut-off lever		10-027 U64	10-027 U64	10-027 U64
88	Cam disk				
89	Tone arm control lever		10-027 U39	obsolete, replace by part 89 ++ in connection with the parts 145 ++, 148 ++, and 149 ++	
89 ++	Tone arm control lever		10-027 U90	10-027 U90	10-027 U90
90	Tone arm coupling rod		10-027 U41	10-027 U41	10-027 U41
91	Pause gap actuating lever		10-038 U20	10-038 U20	10-038 U20
101	Insulating hose	4	10-027-95	10-027-95	10-027-95
102	Felt hose		10-027-258	10-027-258	10-027-258
103	Benzing-type washer		10-027-101	10-027-101	10-027-101
104	Spring washer		10-038-24	10-038-24	10-038-24
105	Pivot	10	10-038-17	10-038-17	10-038-17
106	Shoulder screw		10-038-54	10-038-54	10-038-54
107	Washer		10-038-71	10-038-71	10-038-71
108	Ram	14	10-027 U20	10-027 U20	10-027 U20
109	Rubber cogwheel	18	10-027-39	10-027-39	10-027-39
110	Felt washer	20	10-027-44	10-027-44	10-027-44
110a	Slide		10-038 U47	10-038 U47	10-038 U68 0
111	Support		10-054-2	10-054-2	10-054-2
112	Bracket	22	10-027-266	10-027-266	10-027-266
113	Leaf spring		10-027-62	10-027-62	10-027-62
113a	Contact bank		—	—	10-027 U81 0
114	Compression spring	26	10-027-30	10-027-30	10-027-30
115	Lid		—	10-027-311	—

SPARE PART LIST FOR XA 100

REF. NO.	Description	Belongs to	XA 100 up to Serial No. 204 800 Order No.	XA 100 from Serial No. 204 801 to 213 900 Order No.	XA 100 5 Push Buttons from Serial No. 213 901 Order No.
116	Bar		—	—	10-027-308 0
117	Stop button	30	—	—	10-027-282 0
118	Stop bar		—	—	10-027 U107 0
119	Washer		10-038-71	10-038-71	10-038-71
119a	Tension spring		—	—	10-027-267 0
120	Bolt	33	10-027-61	10-027-61	10-027-61
121	Bolt		10-027-56	10-027-56	10-027-56
122	Bar for Repeat	38	10-027-182	10-027-182	10-027-182
123	Bolt		10-027-193	10-027-193	10-027-193
124	Rubber ring	39	10-012-48	10-012-48	10-012-48
125	Spacing washer		1-02301-197	1-02301-197	1-02301-197
126	Step pulley for 60 cycles	48	10-036-30	10-036-30	10-036-30
126a	Step pulley for 50 cycles		10-036-29	10-036-29	10-036-29
127	Wire clamp		10-027-190	10-027-190	10-027-190
128	Cardboard washer (Sliding clutch)	53	10-027-94	10-027-94	10-027-94
129	Washer	54	10-038-56	10-038-56	10-038-56
130	Bolt	57	10-027-61	10-027-61	10-027-61
131	Spring washer	59	10-027-208	10-027-208	10-027-208
132	Tension spring	61	10-027-214	10-027-214	10-027-214
133	Washer	62	10-027-91	10-027-91	10-027-91
134	Spring	63	10-027-212	10-027-212	10-027-212
135	Bolt		10-027-209	10-027-209	10-027-209
136	Ring	74	10-027-136	10-027-136	10-027-136
137	Washer	76	10-027-237	10-027-237	10-027-237
138	Saddle spring	84	10-027-208	10-027-208	10-027-208
139	Headless screw	85	10-027 U70 +	10-027 U70	10-027 U70
140	Helical twist spring		10-027-152	10-027-152	10-027-152
141	Tension spring		10-027-153	10-027-153	10-027-153
142	Helical twist spring	86	10-027-180	10-027-180	10-027-180
143	Compression spring		10-027-137	10-027-137	10-027-137
144	Ring spring	87	10-027-164	10-027-164	10-027-164
145	Support for rocker		10-027-170	these parts are obsolete, must be replaced by parts 145 ++, 148 ++, 149 ++ in connection with part 89 ++	
146	Headless screw		10-027-74		
147	Brake cap		10-027-73		
148	Compression spring	89	10-027-162		
145 ++	Support for rocker		10-027 U91	10-027 U91	10-027 U91
148 ++	Compression spring		10-027-326	10-027-326	10-027-326
149 ++	Brake bolt		10-027-325	10-027-325	10-027-325
150	Compression spring		10-027-173	10-027-173	10-027-173
151	Slider	90	10-027-177	10-027-177	10-027-177
152	Gear plate, compl.		10-038 U60 +	10-038 U60	10-038 U60
153	Tooth segment		10-038-37	10-038-37	10-038-37

SPARE PART LIST FOR XA 100

REF. NO.	Description	Belongs to	XA 100 up to Serial No. 204 800 Order No.	XA 100 from Serial No. 204 801 to 213 900 Order No.	XA 100 5 Push Buttons from Serial No. 213 901 Order No.
154	Spring		10-027-132	10-027-132	10-027-132
155	Segment		10-038 U18	10-038 U18	10-038 U18
156	Spring washer		10-038-75	10-038-75	10-038-75
157	Bolt	152	10-027-131	10-027-131	10-027-131
158	Tension spring		10-027-31	10-027-31	10-027-31
159	Plate		10-027-200	10-027-200	10-027-200
160	Contact spring		10-027-201	10-027-201	10-027-201
161	Contact spring		10-027-202	10-027-202	10-027-202
162	Plate		10-027-203	10-027-203	10-027-203
163	Ball bearing race		10-027-103	10-027-103	10-027-103
164	Cage for ball bearing		10-027-102	10-027-102	10-027-102
165	Ball		1, 5 Ø Kl. III	1, 5 Ø Kl. III	1, 5 Ø Kl. III
166	Bracket		10-027-106	10-027-106	10-027-106
167	Clamp		10-026-2	10-026-2	10-026-2
168	Cup		10-027-197	obsolete, must be replaced by parts 168 ++, 170 ++, 171 ++ and 172 ++	
169	Rubber ring		10-027-232		
168 ++	Cup	Parts	10-031-42	10-031-42	10-031-42
170 ++	Tray	needed	10-031-43	10-031-43	10-031-43
171 ++	Truncated cone spring (blue)	for installation	10-027-286	10-027-286	10-027-286
172 ++	Truncated cone spring (nickel-plated)		10-027-287	10-027-287	10-027-287
173	Plastic plug		10-031-51	10-031-51	10-031-51
174	Bakelite connector		Erk 777	Erk 777	Erk 777
175	Insulating plate		10-027-183	10-027-183	10-027-183
176	Pick-up lead	Electr.	10-038 U54	10-038 U54	10-038 U54
177	Power cord	acces-	LiV 3-1007	LiV 3-1007	LiV 3-1007
178	Paper condenser C1	sories		0, 1uF, 500 V-	0, 1uF, 500 V-
179	Carbon resistor W2			30 Ohm 1 Watt	30 Ohm 1 Watt
180	Carbon resistor W1		10 kOhm 0, 25 W	10 kOhm 0, 25 W	10 kOhm 0, 25 W
181	Clip for record spindles	Mechan-	10-027 U48	10-027 U48	10-027 U48
182	Clip for adaptor	ical acces-	10-027-224	10-027-224	10-027-224
183	Clip for record spindle SA 38 C	sories	10-025-15	10-025-15	10-025-15

METRIC HARDWARE FOR XA 100

REF. NO.	Description	Collective Name	XA 100 from Serial No. 200 001 Order No.	
201	Self-tapping cylindrical screw		BM 3x6	DIN 7513
202	Self-tapping cylindrical screw		BM 3x8	DIN 7513
203	Self-tapping cylindrical screw		BM 3x15	DIN 7513
204	Self-tapping buttonhead screw		CM 2, 6x6	DIN 7513
205	Cylindrical screw		AM 2, 6x12	DIN 84
206	Cylindrical screw		AM 2, 6x5	DIN 84
207	Cylindrical screw	Screws	AM 2, 6x6	DIN 84
208	Cylindrical screw		AM 3x4	DIN 84
209	Cylindrical screw		AM 3x6	DIN 84
210	Cylindrical screw		AM 3x15	DIN 84
211	Cylindrical screw		AM 4x5	DIN 84

METRIC HARDWARE FOR XA 100

REF. NO.	Description	Collective Name		XA 100 from Serial No. 200001 Order No.	
212	Self-tapping lentilhead screw			AM 3x6	DIN 91
213	Self-tapping lentilhead screw			AM 3x8	DIN 91
214	Headless screw			M 2,6x3	DIN 551
215	Headless screw		Norm	M 3x6	DIN 553
216	Headless screw			M 3x8	DIN 551
217	Headless screw			M 4x8	DIN 553
218	Roundheaded wood screw		parts	2x10	DIN 96
219	Hexagonhead nut			M 2,6	DIN 934
220	Hexagonhead nut			M 3	DIN 934
221	Hexagonhead nut			BM 3	DIN 439
222	Hexagonhead nut			BM 3,5	DIN 439
223	Hexagonhead nut	Nuts		BM 4	DIN 439
224	Hexagonhead nut			M 4	DIN 934
225	Hexagonhead nut			BM 8	DIN 439
226	Squarehead nut			M 3	DIN 562
227	Washer			2,8	DIN 433
228	Washer			3,2	DIN 433
229	Washer	Washers		3,2	DIN 125
230	Washer			4,3	DIN 433
231	Washer			4,3	DIN 125
232	(for idler wheel)			8/4,3x0,5 WN 2311 Hp	
233	Benzing-type washer			2,3	DIN 6799
234	Benzing-type washer			3,2	DIN 6799
235	Benzing-type washer	Benzing-type Washers		4	DIN 6799
236	Benzing-type washer			5	DIN 6799
237	Benzing-type washer			7	DIN 6799
238	Soldering lug	Soldering lug		3x12 B 1	DIN 41496
239	Clamp	Clamp		1x4 Kr	DIN 2571
240	Ball			1 / III	

PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

OLYMPIC MODELS 14TT50, 17TU51, 17TU52 (Ch. CT, CU)

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OLYMPIC MODELS 14TT50, 17TU51, 17TU52 (Ch. CT, CU)

OLYMPIC MODEL 14TT50 (Ch. "CT")

TRADE NAME	Olympic Models 14TT50 (Ch. "CT"), 17TU51, 17TU52 (Ch. "CU")
MANUFACTURER	Olympic Radio & Television Inc., 34-01 38th. Ave., Long Island City 1, N.Y.
TYPE SET	Television Receiver
TUBES	Thirteen
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.21 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 26.25MC, Sound IF 21.75MC (Intercarrier)

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DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 push-on type control knobs from front panel of cabinet.

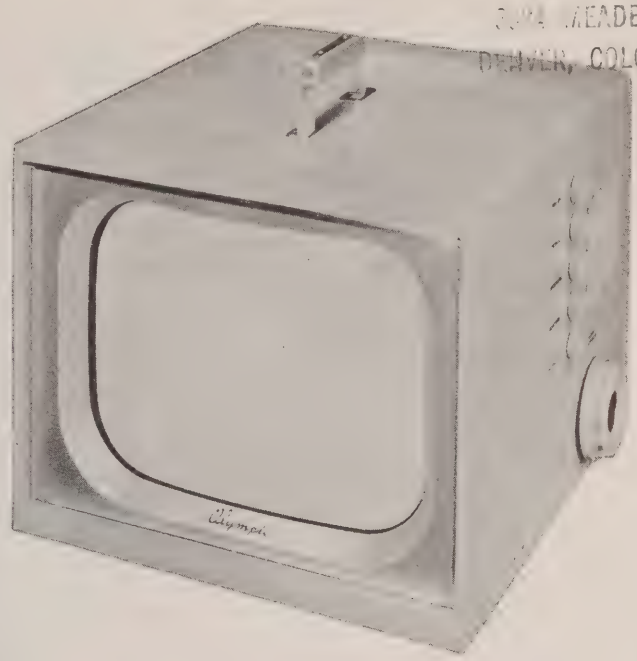
2. Remove 5 wood screws. Remove rear cover.

3. Disconnect speaker leads.

4. Lay cabinet face down on a soft surface.

5. Remove 5 cabinet base bolts. Restore cabinet to its normal upright position and lift cabinet from cabinet base.

6. Remove 2 speaker nuts. Remove speaker.



MODEL	CHASSIS
14TT50	"CT"
17TU51, 17TU52	"CU"

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 3 wood screws holding metal molding at top edge of the safety glass. Remove molding and safety glass. Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The horizontal oscillator may be adjusted from the rear panel of the chassis. Set the horizontal hold control at the center of its range and adjust the horizontal frequency slug (L13) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, it is necessary to remove the rear cover and supply power to the chassis. Adjust the buzz control (R8) for maximum volume and minimum buzz.

FUSES

One fuse is used for horizontal sweep circuit protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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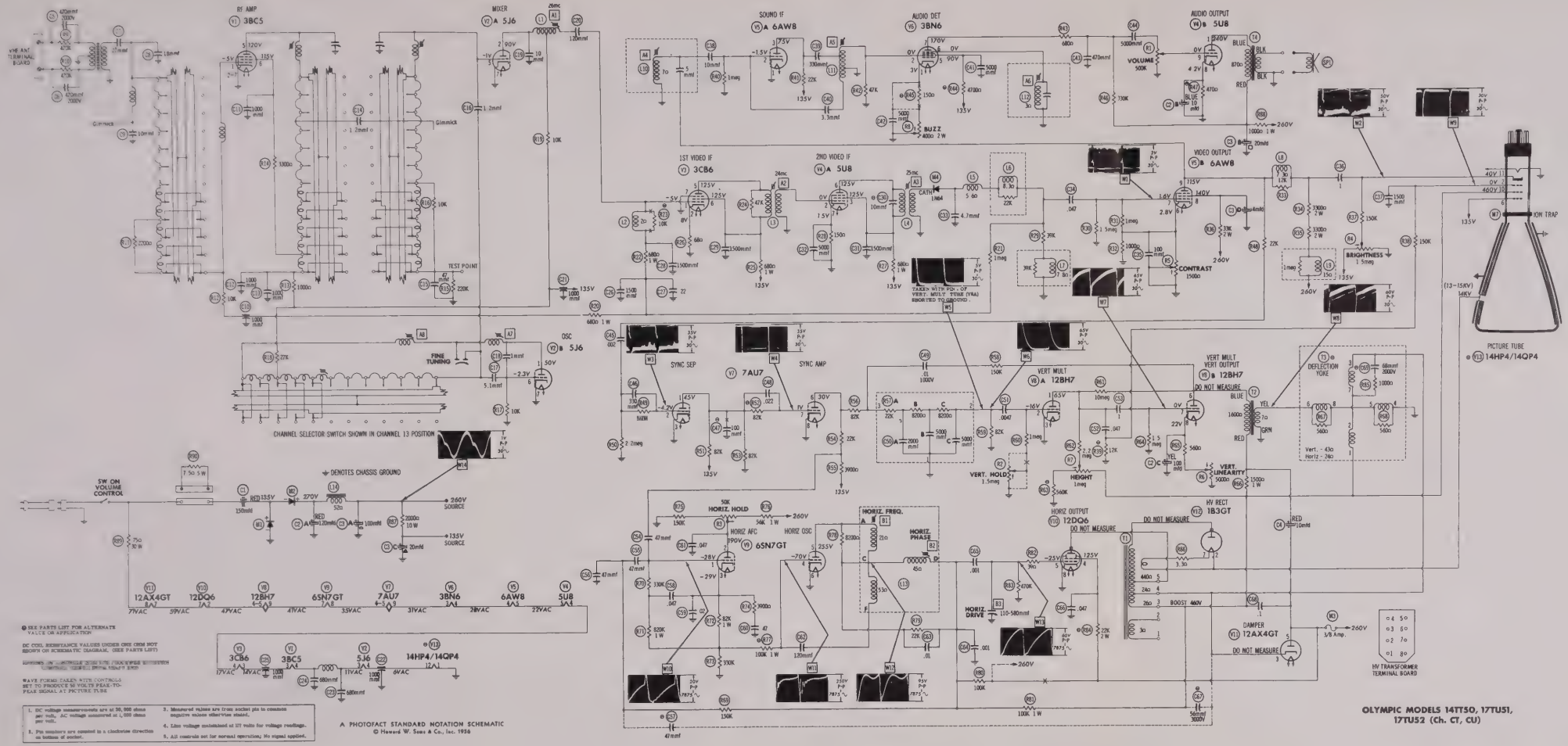
OLYMPIC MODELS 14TT50, 17TU51, 17TU52 (Ch. CT, CU)
RF AMP
3BC5
MIXER
5J6
SOUND IF
6AW8
AUDIO DET
3BN6
AUDIO OUTPUT
5U8
1ST VIDEO IF
3CB6
2ND VIDEO IF
5U8
VIDEO OUTPUT
6AW8
SYNC SEP
SYNC AMP
7AU7
VERT MULT
12BH7
VERT MULT
VERT OUTPUT
12BH7
DO NOT MEASURE
OSC
5J6
HORIZ OSC
6SN7GT
HORIZ OUTPUT
12DQ6
DO NOT MEASURE
HV RECT
1B3GT
DAMPER
12AX4GT
DO NOT MEASURE
PICTURE TUBE
14HP4/14QP4
ION TRAP
DEFLECTION YOKE
VOLUME
500K
BRIGHTNESS
1.5meg
CONTRAST
1500Ω
HEIGHT
1meg
VERT. HOLD
1.5meg
VERT. LINEARITY
5000Ω
HORIZ. HOLD
50K
HORIZ AFC
HORIZ FREQ.
HORIZ PHASE
HORIZ DRIVE
BOOST 460V
FINE TUNING
TEST POINT
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
SW ON VOLUME CONTROL
DENOTES CHASSIS GROUND
260V SOURCE
135V SOURCE
12AX4GT 19VAC
12DQ6 59VAC
12BH7 47VAC
6SN7GT 41VAC
7AU7 35VAC
3BN6 31VAC
6AW8 28VAC
5U8 22VAC
3CB6 17VAC
3BC5 12VAC
5J6 11VAC
14HP4/14QP4 9VAC
12AJ
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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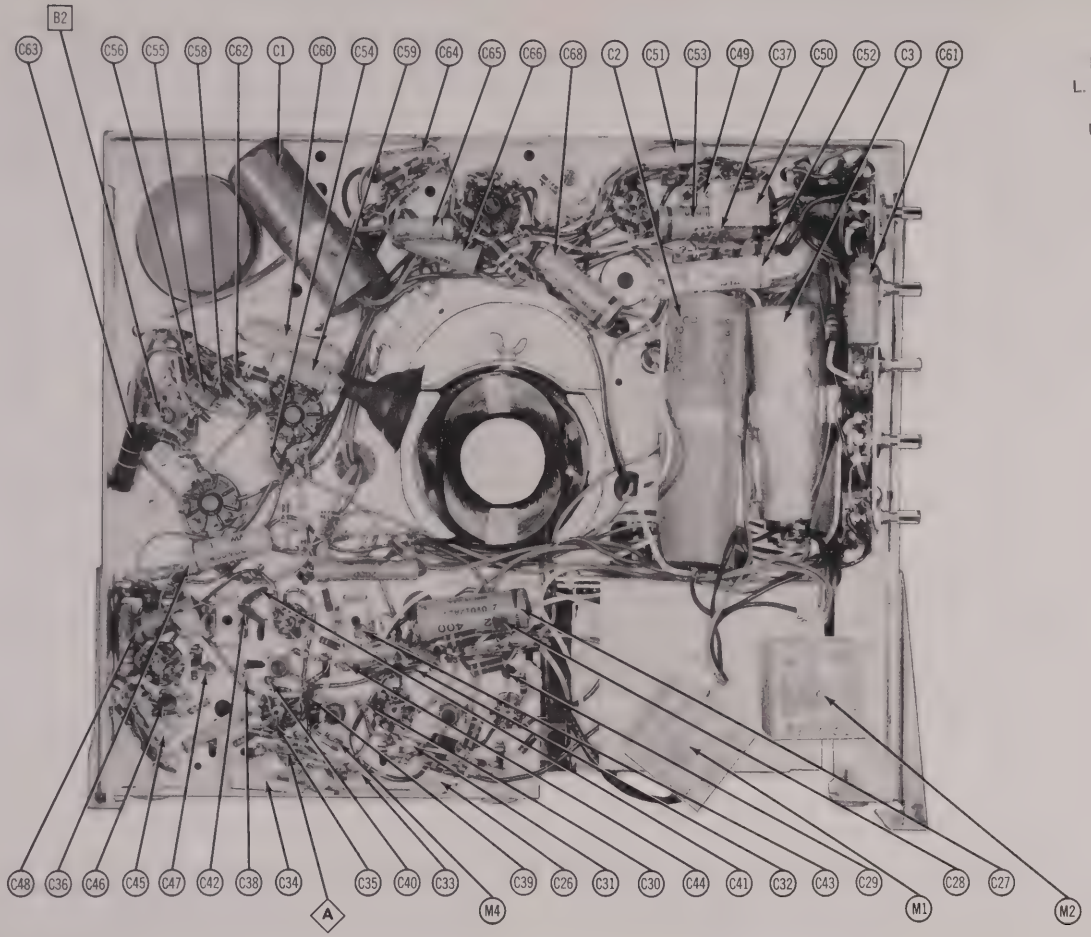
OLYMPIC MODELS 14TT50, 17TU51, 17TU52 (Ch. CT, CU)



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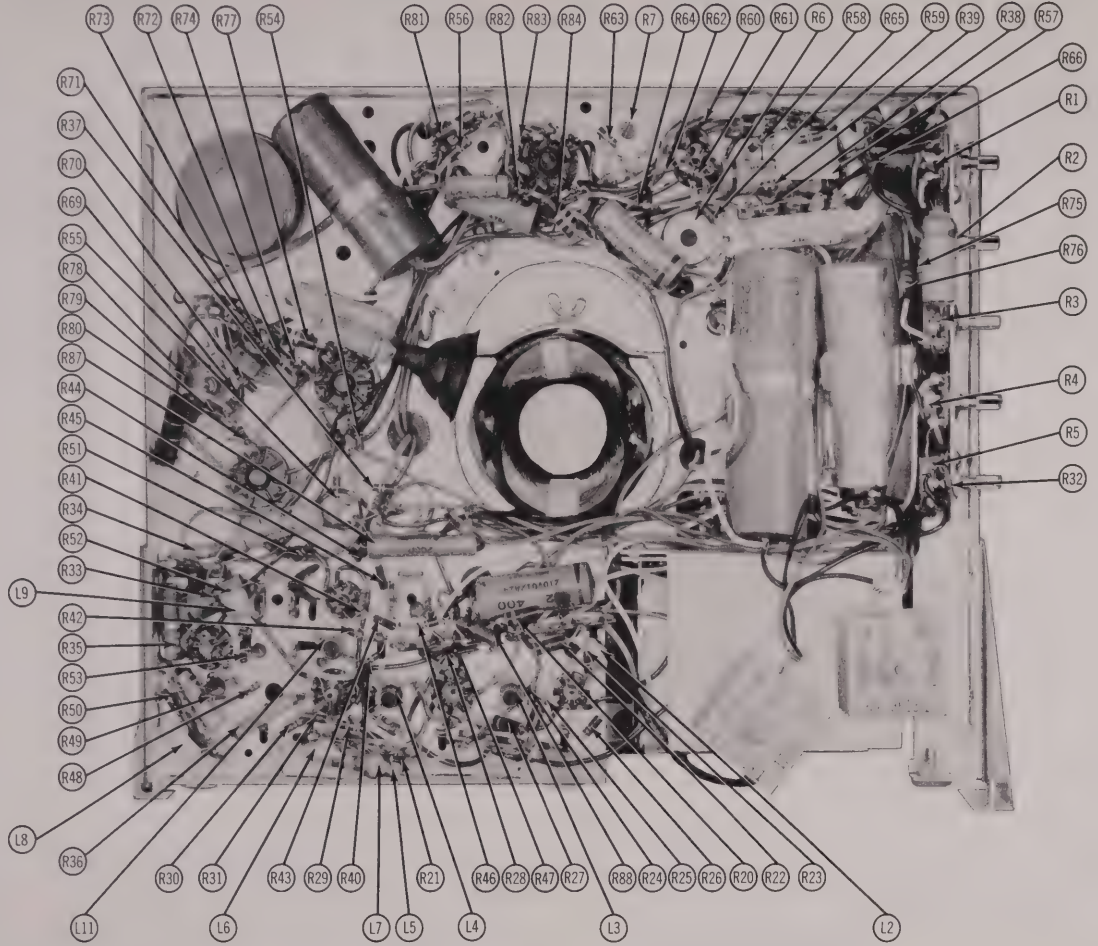
CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

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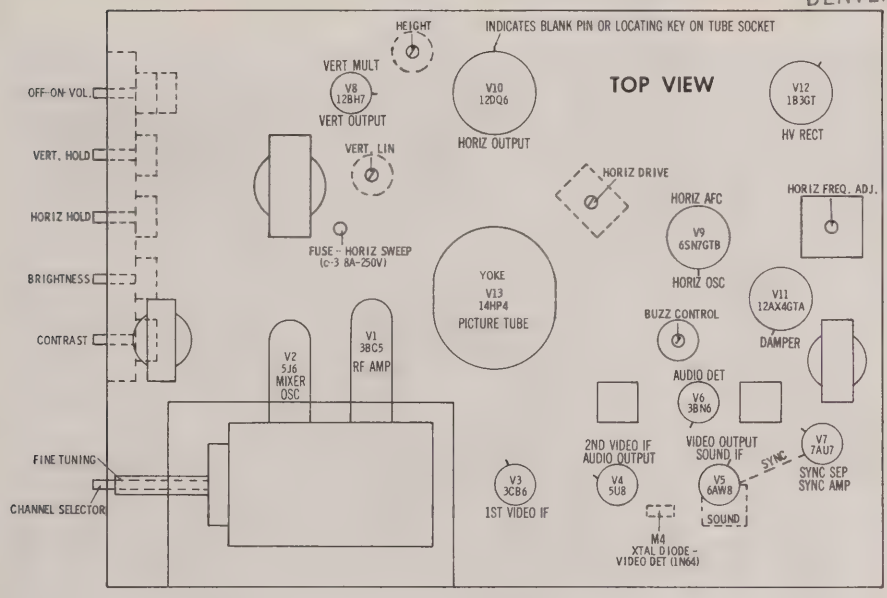
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

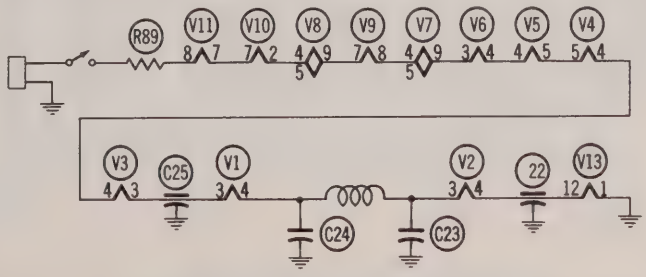
POWER SUPPLY FAILURE
No raster, no sound - Selenium Rectifers (M1 & M2)

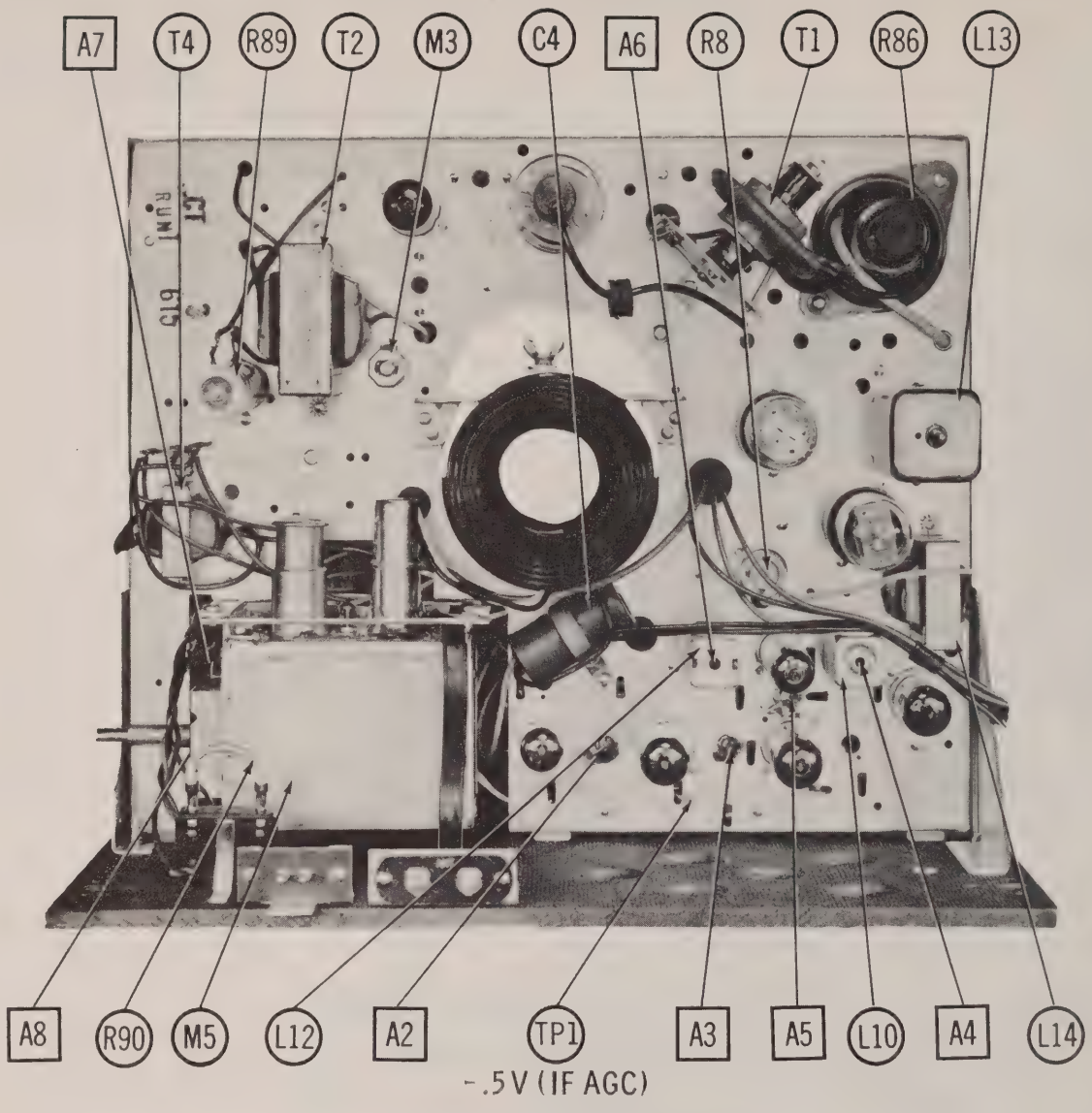
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V5, V13
Has pic, no sound - V4, V5, V6

SYNC FAILURE
No vert. sync - V7, V8
No horiz. sync - V7, V9
No vert. or horiz. sync - V7

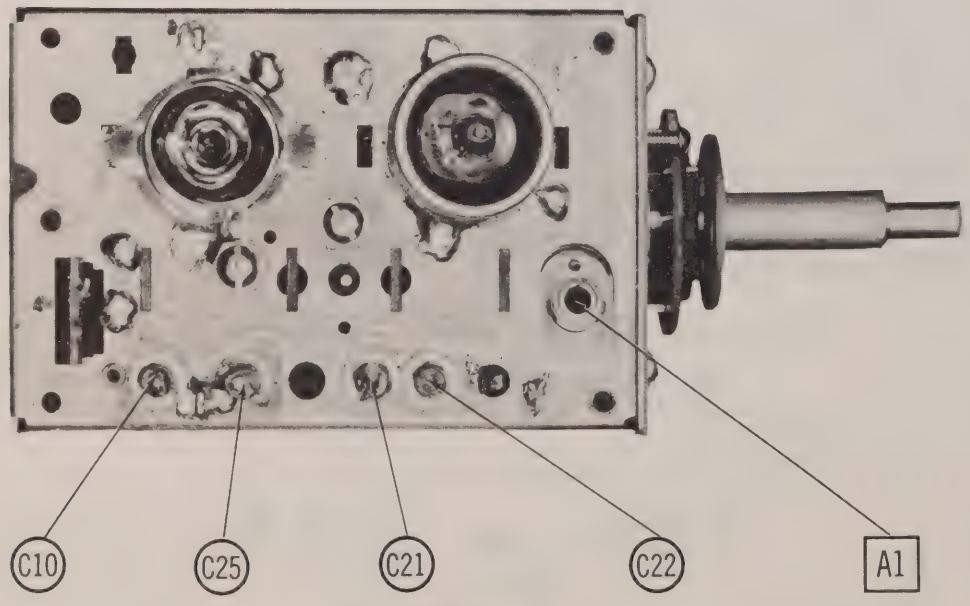
SWEEP FAILURE
No raster, has sound - V9, V10, V11, V12, V13, Fuse (M3)
No vertical deflection - V8
Poor vert. linearity or foldover - V8
Poor horiz. linearity or foldover - V9, V10, V11
Narrow picture - V9, V10, V11, V12, M1, M2
Vert. off freq. - V7, V8
Horiz. off freq. - V7, V9

NOTE: Since this receiver employs tubes used in a series filament network, an open filament in any tube in series will cause the set to be inoperative. (See circuit below).



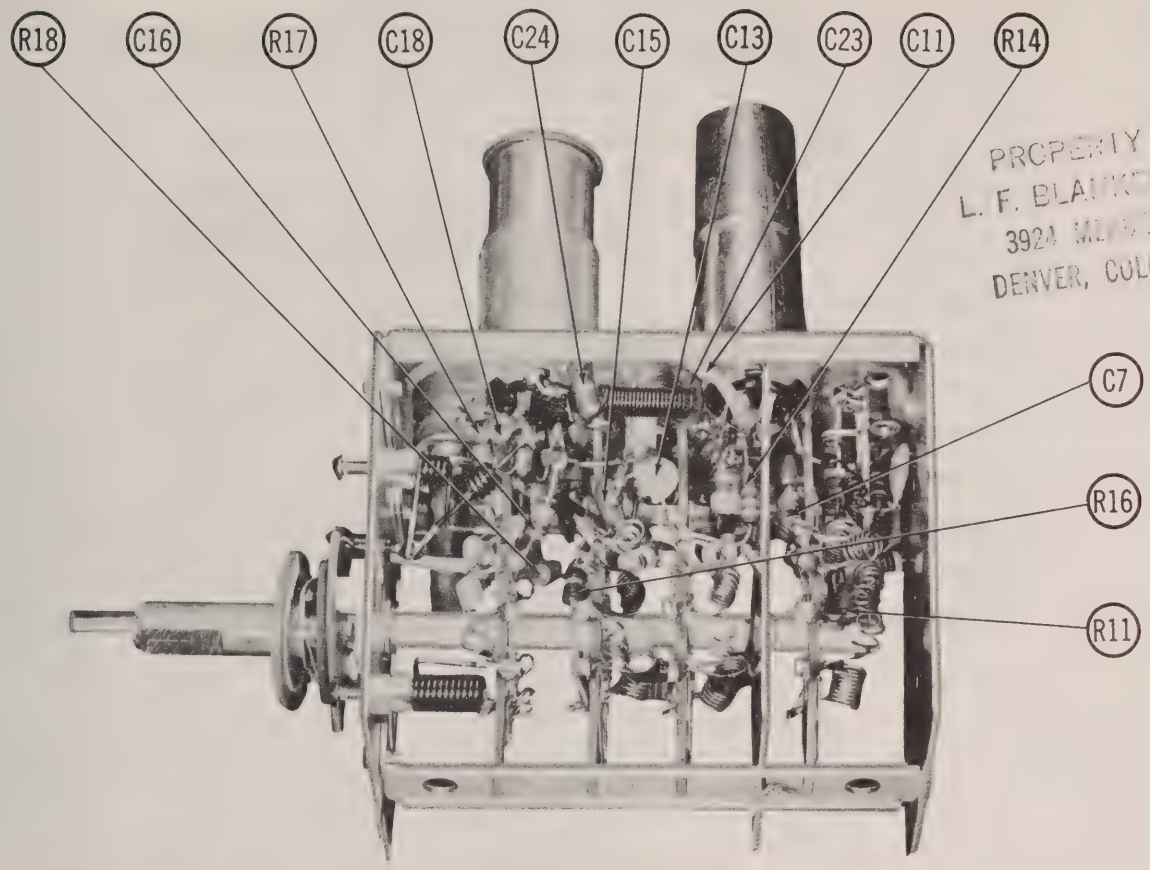


CHASSIS TOP VIEW

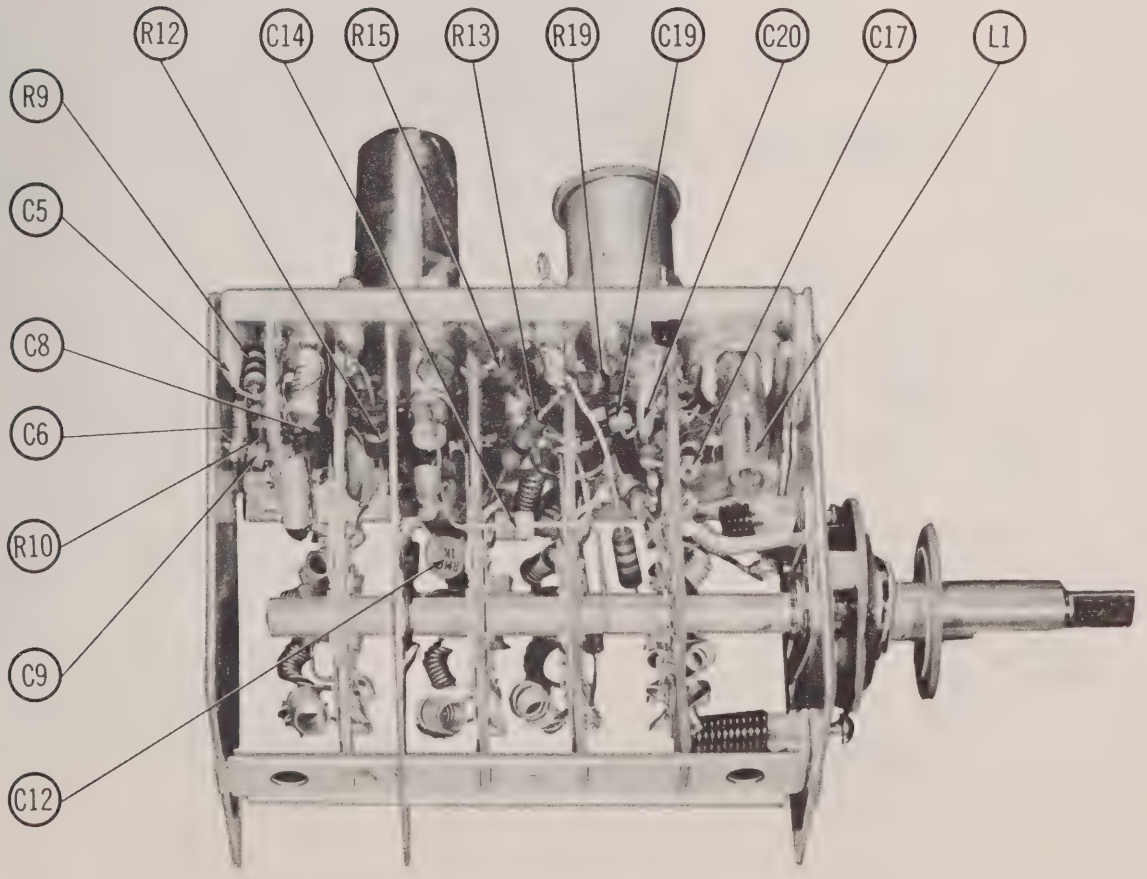


RF TUNER-TOP VIEW

PROPERTY OF
L. F. BLAIKOSHI
3924 M[illegible] S.
DENVER, COLORADO



RF TUNER-RIGHT SIDE

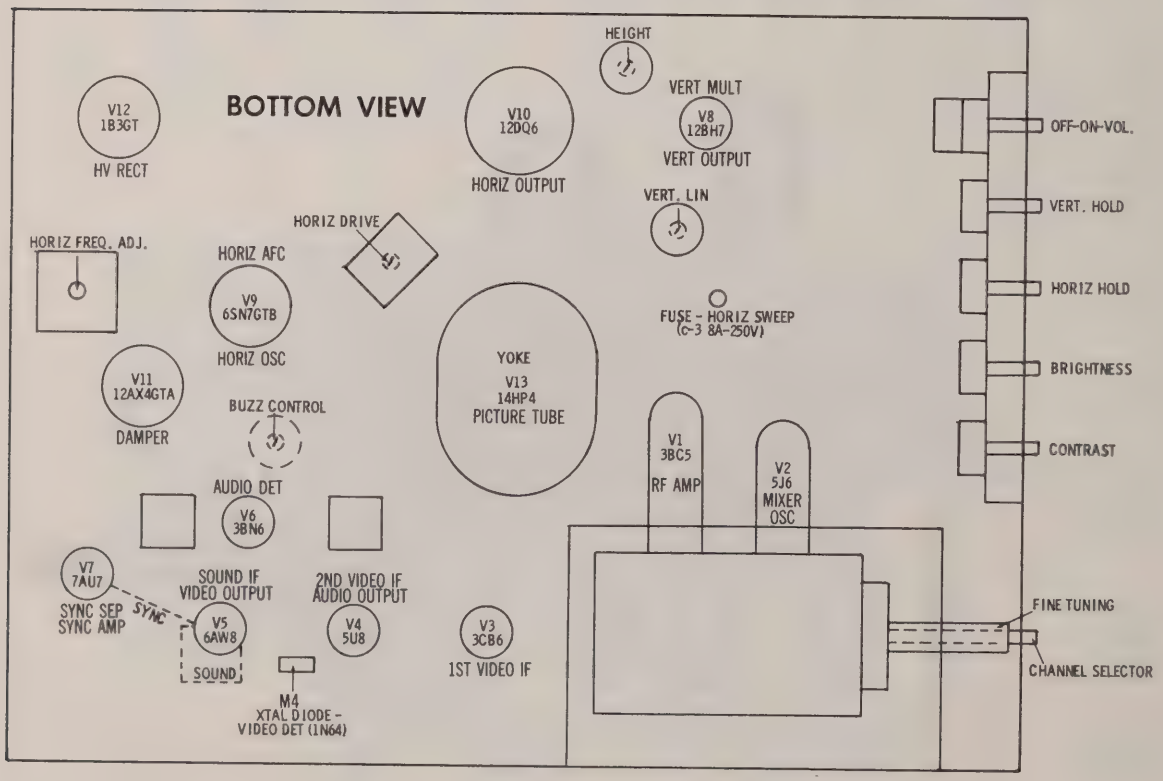


RF TUNER-LEFT SIDE

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BC5	1Meg	0Ω	3.5Ω	2.5Ω	† 3000Ω	† 6500Ω	0Ω		
V2	5J6	† 30K	† 12K	2.5Ω	1.5Ω	220K	10K	0Ω		
V3	3CB6	1Meg	68Ω	3.5Ω	4Ω	† 2700Ω	† 2700Ω	0Ω		
V4	5U8	† 1800Ω	.1Ω	† 2700Ω	4Ω	5Ω	† 2700Ω	150Ω	470Ω	● 250K
V5	6AW8	0Ω	1Meg	† 24K	7Ω	5Ω	● 120Ω	550K	† 33K	† 6500Ω
V6	3BN6	● 350Ω	2.6Ω	8Ω	7Ω	† 6500Ω	3Ω	† 330K		
V7	7AU7	† 50K	2.7Meg	0Ω	9Ω	9Ω	† 28K	130K	0Ω	8Ω
V8	12BH7	*1.8Meg	● 1.6Meg	0Ω	11Ω	11Ω	*3000Ω	1.5Meg	● 2300Ω	10Ω
V9	6SN7GT	1.5Meg	● † 40K	400K	400K	*70K	0Ω	10Ω	9Ω	
V10	12DQ6	TP	11Ω	NC	† 22K	470K	TP	14Ω	0Ω	TOP CAP *24Ω
V11	12AX4GT	NC	NC	170K	NC	† 50Ω	NC	14Ω	16Ω	
V12	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								TOP CAP *465Ω
V13	14HP4	0Ω	160K	PIN 6 † 2000Ω	PIN 10 *11Ω	PIN 11 ● † 370K	PIN 12 1.5Ω			

† MEASURED FROM OUTPUT OF M2.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
* MEASURED FROM PIN 3 OF V11.
TP TIE POINT
NC NO CONNECTION.



TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube (V9) to disable the high voltage.

VIDEO IF ALIGNMENT

In step 2 use only enough sweep generator output for usable pattern on scope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over converter tube being careful not to let it touch the grounded shield. Low side to chassis.	Not used	26MC	Any unused channel	USE VTVM. DC probe to point (A). Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	"	24MC	"	"	A2	"
3.	"	"	"	25MC	"	"	A3	"
4.	"	"	24MC (10MC Swp)	23.75MC 26.25MC	"	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.		Connect the negative lead of a 3 volt battery to the ungrounded side of C27. Connect positive to chassis. Check for response similar to Fig. 1. If necessary retouch A1 and A2. A1 affects the high frequency side of response curve and A2 affects the low frequency side.

SOUND IF ALIGNMENT USING ON THE AIR SIGNAL

Connect the DC probe of the VTVM to pin 2 of the audio detector tube (V6).
Common to chassis. Turn the set on and tune in a strong TV station. Adjust A4 and A5 for maximum deflection on VTVM. Disconnect VTVM from the receiver. Set the buzz control (R8) to its mid-range position and adjust the quadrature coil (A6) for maximum volume. Adjust R8 for maximum volume and minimum buzz. Retouch A4 and A5 for maximum volume.

OSCILLATOR ALIGNMENT

Connect the negative lead of a 3 volt battery to the ungrounded side of C27.
Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 50K to point A. Low side to chassis.	A7	Adjust to place sound marker in trap notch as in Fig. 2. Video marker should fall at 50%.
6.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A8	"

RF ALIGNMENT

The RF and Mixer portion of this receiver have been properly aligned at the factory and are very stable. Alignment of this portion should not be required in the field.

PROPERTY OF
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3994 IMBODE ST.
DENVER, COLORADO

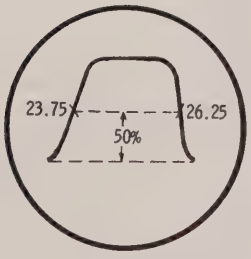


FIG. 1

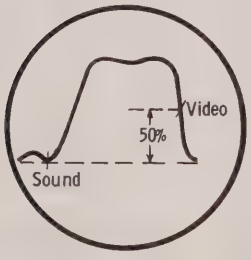


FIG. 2

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amplifier	3BC5	
V2	Mixer-Oscillator	5J6	
V3	1st Video IF Amplifier	3CB4	
V4	2nd Video IF Amplifier-Audio Output	5U8	
V5	Video Output-Sound IF Amp	6AW8	
V8	Audio Detector	3BN6	

ITEM No	USE	TYPE	NOTES
V7	Sync Sep.-Sync Amp	7AU7	
V8	Vert. Mult.-Vert. Output	12BH7	
V9	Horiz. AFC-Horiz. Osc	6BN7GT	
V10	Horiz. Output	12DA6	
V11	Damper	12AX4GT	
V12	HV Rectifier	1B3GT	

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	OLYMPIC PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V13	16SR5 or 142P4	142P4	16SR5 or 142P4	16SR5 or 142P4 ①	1) Aluminized 2) Silver screen "85"
	17AVP4	17AVP4A ①	17AVP4A ①	17AVP4A ②	

ELECTROLYTIC CAPACITORS

ITEM No	RATING			REPLACEMENT DATA						NOTES
	CAP. MFD	VOLT	OLYMPIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.	
C1	150	150	CGM33	PRI-150	XA094	TC106	TD-150-150	S-106	TVA-1433	
C2A	250	300	CG4594	PR4-300		WT400		Q-155	R2307 *	
B	25	25								
C	100	50						Q-040	TVL-4705.3	
C3A	100	300	CG4653	AFH4-88-80		FP433.9		MTU-3520		
B	30	300								
C	30	300								
C4	4	350								
C5	40	150	CG4023	PRR450V10	BR1043	TC73	TD-10-450	FM-4810	TVA-1705	

* Non-cashing item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING		REPLACEMENT DATA							NOTES
		VOLT	OLYMPIC Part No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	470	2000	HYD-20-470	DD30-471	V37A7	3KY-471	DC30347	30GA-747		
C7	470	3000	HYD-30-470	DD30-471	V37A7	3KY-471	DC30347	30GA-747		
C7	27		HPD-6236	TC2-27	TZ2S	NPOL-270	ET-5436	5TCC-Q26		
C8	10				TZ13	NPOL-100				
C9	10		HPD-6210	TC2-10	TZ09	NPOA-100	ET-541	5TCC-Q1		
C10	1000									
C11	1000		BPD-001	DD-102	K069	801-001	DC-531	5HK-D1		
C12	1000		BPD-001	DD-102	K069	801-001	DC-531	5HK-D1		
C13	1000		BPD-001	DD-102	K069	801-001	DC-531	5HK-D1		
C14	1.3									
C15	47		HPD-6247	TC2-47	TZ33	NPO-338-470	ET-5447	5TCC-Q47		
C16	1.3									
C17	5.1									
C18			MPD-521	TCK-1	TS02	NPOA-010	ET-541	5TCCB-V1		
C19	10		HPD-6210	TC2-10	TZ09	NPOA-100	ET-541	5TCC-Q1		
C20	120		DH-06023	DD-121	G044	811-121	DC-5315	5GA-T13		
C21	330									
C22	1000									
C23	680		E3680	D6-681	TP50	GPLK-681	UC-5360	5GA-T68		
C24	680		E3680	D6-681	TP50	GPLK-681	UC-5360	5GA-T68		
C25	1000									
C26	1500		BPD-0015	DD-152	K071	801-0015	DC-5315	5HK-D15		
C27	33	400	PHSH-33				ET-5433	47M-P33		
C28	1500		BPD-0015	DD-152	K071	801-0015	DC-5315	5HK-D15		
C29	1500		BPD-0015	DD-152	K071	801-0015	DC-5315	5HK-D15		
C30	15		HPD-6215	TC2-15	TZ11	NPOA-150	ET-541	5TCC-Q1		Note 1
C31	1500		BPD-0015	DD-152	K071	801-0015	DC-5315	5HK-D15		
C32	5000		BPD-0050	DD-502	K080	811-005	DC-535	5HK-D5		
C33	4.7	400	C0083	HPE-824.7	TCZ-4R7	TZ07	NPOA-4R7	ET-5547	5TCCB-V47	
C34	0.047	600		BPD-05	DF-503	CUB4047		PT1417	47M-S47	
C35	100	600		BPD-0001	DD-101	G043	801-101	UC-531	5GA-T1	
C36	1.1	600		PHSH-1		PT401		PT401	47M-P1	
C37	1500		CCD15X5	BPD-0015	DD-152	K071	801-0015	DC-5315	5HK-D15	
C38	10		CCD10X5	NPO-D10	TC2-10	S010	NPOA-100	ET-541	5TCC-Q1	
C39	330			BPD-00033	DD-331	G056	811-331	UC-5333	5GA-T33	
C40	3.3		C0346S	NPO-S33.3	TCZ-3R3	TZ06	NPOA-3R3	ET-5433	5TCCB-V33	
C41	5000		CCD502X	BPD-005	DD-502	K080	811-005	DC-535	5HK-D5	
C42	5000		CCD502X	BPD-005	DD-502	K080	811-005	DC-535	5HK-D5	
C43	470		CCD471X	BPD-0047	DD-471	K060	811-471	ET-5347	5GA-T47	
C44	5000		CCD502X	BPD-005	DD-502	K080	811-005	DC-535	5HK-D5	
C45	.002	600		BPD-002	DH-202	CUB4D2	GPX-333-202	PT623	47M-D2	
C46	330			BPD-0033	DH-331	G062	801-331	UC-5333	5GA-T33	
C47	100		CCD10IM	BPD-0001	DD-101	G043	801-101	UC-531	5GA-T1	Note 2
C48	.022	600		BPD-02	DF-203	CUB4S22	81T-03	PT1123	47M-S22	
C49	.01	1000		PD5S3H-01	DD-103	CUB1S01		PT511	16TM-01	
C50A	3000							DC-525		
B	5000		YPC343S	YPA-I50	YPC-100	†1157M1	†1405-01	DC-535	†V-1	
C	5000							DC-535		
C51	0.047	600		0464-0047		1R5D47			MS-247	
C52	.047	600		BPD-05	DF-503	CUB4S47		PT1417	47M-S47	
C53	.1	600		PHSH-1		PT401		PT401	47M-P1	
C54	.47	600		HPG-4247		2SR54Q7	83-470	ET-5447	MS-447	
C55	.47	600		HPG-4247		2SR54Q7	83-470	ET-5447	MS-447	
C56	.47	600		HPG-4247		2SR54Q7	83-470	ET-5447	MS-447	
C57	.47	600		HPG-4247		2SR54Q7	83-470	ET-5447	MS-447	Note 3
C58	.047	600		BPD-05	DF-503	CUB4047		PT1417	47M-S47	
C59	.03	600		BPD-03	DF-303	CUB4S3	81T-03	PT413	47M-S3	
C60	.047	600		PHSH-47		CUB4P47		PT4047	47M-P47	
C61	.047	600		BPD-05	DF-503	CUB4S47		PT1417	47M-S47	
C62	130	500		HPG-4130	DH-331	2SR5Y1	81T-121		MS-121	
C63	.01	600				1R5D1	81J-103	MCB2S5	MS-21	
C64	.001	300		1464-001		CUB4D1	GPXL-102	PT831	47M-D1	
C65	.001	300		BPD-001	DD-102	CUB4D1		PT1417	47M-S47	
C66	.047	600		BPD-05	DF-503	CUB4S47		PT1417		
C67	56	5000			DD30-560		3KY-560	DC30456		Note 3
C68	.1	600		PHSH-1		DF-104	CUB4P1	PT401	47M-P1	
C69	68	8000	CG4623	HYD-30-68	DD30-680	V34Q68	3KV-680	DC30468	30GA-Q68	Note 4

† Items C56A, C56B, C56C, R57A, R57B and R57C are combined in one unit.
Note 1. Some versions may use 6.8MMF unit (part #CC4417) in this application.
Note 2. Not used in some versions.
Note 3. Used in CU chassis only.
Note 4. Some CT chassis may use 56MMF unit (part #CCD560K) in this application. CU chassis uses 100MMF unit in this application.

PARTS LIST AND DESCRIPTIONS

CONTROLS

ITEM No	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST ANCE	WATTS	OLYMPIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	1	PT2S15	AB-58	A47-500K-2	Q13-133	U46	Volume
B	Shaft		Not Req.	AK-4	KSB-3	Not Req.	Not Req.	Attach to R1A
C	Shaft		Not Req.	AK-11	SWE-13	TA-1	U35	Attach to R1A
R2A	1.5Meg	1	PT3S18-1	AB-743	A47-1.5Meg -S	Q13-137	U155	Vert. Hold
B	Shaft		Not Req.	AK-4	KSB-3	Not Req.	Not Req.	Attach to R2A
R3A	50K	1	PT2S17	AB-31	A47-50K-S	Q11-133	U35	Horiz. Hold
B	Shaft		Not Req.	AK-4	KSB-3	Not Req.	Not Req.	Attach to R3A
R4A	1.5Meg	1	PT3S18-1	AB-743	A47-1.5Meg -S	Q13-137	U155	Brightness
B	Shaft		Not Req.	AK-4	KSB-3	Not Req.	Not Req.	Attach to R4A
R5A	150Ω	1	PT2S18	AB-515		Q17-109	U8	Contrast
B	Shaft		Not Req.	AK-4		Not Req.	Not Req.	Attach to R5A
R6A	500Ω	1	PT2S19-1	AK-10	A47-500Ω-S	Q11-114	TA53L	Vert. Linearity
B	Shaft		Not Req.	AK-4		Not Req.	Not Req.	Attach to R6A
R7A	1Meg	1	PT3S65-1	EK-69	A47-1Meg-S	Q13-137	TA16L	Height
B	Shaft		Not Req.	Not Req.	FSB-1/4	Q13	Not Req.	Attach to R7A
R8	40Ω	2	PT3411		3S-50Ω			Brass-wire wound

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	OLYMPIC Part No	IRC PART No.	
R9	470K		BTB-470K		
R10	470K		BTB-470K		
R11	3300Ω		BTB-3300		
R12	10K		BTB-10K		
R13	1000Ω		BTB-1000		
R14	3300Ω		BTB-3300		
R15	220K		BTB-220K		
R16	18K		BTB-10K		
R17	18K		BTB-18K		
R18	27K		BTB-27K		
R19	10K		BTB-10K		
R20	680Ω	1	BTA-680		
R21	1Meg		BTB-1Meg		
R22	680Ω	1	BTA-680		
R23	10K		BTB-10K		Note 1
R24	47K		BTB-47K		
R25	680Ω	1	BTA-680		
R26	680Ω		BTB-680		
R27	680Ω	1	BTA-680		
R28	150Ω		BTB-150		
R29	150Ω		BTB-39K		
R30	1.5Meg		BTB-1.5Meg		
R31	1Meg		BTB-1Meg		
R32	1000Ω		BTB-1000		
R33	12K		BTB-12K		
R34	3300Ω	2	BTB-3300		
R35	3300Ω	2	BTB-3300		
R36	33K	2	BTB-33K		
R37	150K		BTB-150K		
R38	150K		BTB-150K		
R39	12K		BTB-12K		Note 2
R40	1Meg 5%		BTB-1Meg 5%		
R41	22K		BTB-22K		
R42	47K		BTB-47K		
R43	680Ω		BTB-680		
R44	4700Ω		BTB-4700		Note 3
R45	150Ω		BTB-150		Note 4
R46	330K		BTB-330K		
R47	470Ω		BTB-470		Note 4
R48	22K		BTB-22K		
R49	560K		BTB-560K		
R50	2.2Meg		BTB-2.2Meg		

ITEM No	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	OLYMPIC Part No	IRC PART No.	
R51	82K			BTB-82K	
R52	82K			BTB-82K	Note 5
R53	82K			BTB-82K	
R54	22K			BTB-22K	
R55	3900Ω			BTB-3900	
R56	82K			BTB-82K	
R57A	33K			BTB-22K	
B	8300Ω		†PC2455	BTB-8200	
C	8300Ω			BTB-8200	
R58	150K			BTB-150K	
R59	82K			BTB-82K	
R60	1Meg			BTB-1Meg	
R61	10Meg			BTB-10Meg	
R62	2.2Meg			BTB-2.2Meg	
R63	560K			BTB-560K	
R64	1.5Meg			BTB-1.5Meg	
R65	560Ω			BTB-150K	
R66	1500Ω	1			
R67	560Ω				
R68	560Ω				
R69	150K				
R70	330K				
R71	82K	1			
R72	82K 5%				
R73	330K 5%				
R74	3900Ω				
R75	150K			BTB-150K	
R76	56K	1			
R77	100K	1			Note 5
R78	8200Ω				
R79	33K				
R80	100K				
R81	100K	1			
R82	39Ω				
R83	470K			BTB-470K	
R84	82K	2			Note 6
R85	1900Ω				
R86	3.3Ω		RE4419	BW-3.3	
R87	2000Ω	10	RE4695	PW10-2000	
R88	1000Ω	1		BTA-1000	
R89	75Ω	20	RE4596		
R90	7.5Ω	5	RE3823	FR-7.5	

† Items R57A, R57B, R57C, C56A, C56B, C56C are combined in one unit.
Note 1. Not used in some versions.
Note 2. Some versions use an 82K in this application.
Note 3. Some versions use a 3300Ω in this application.
Note 4. Some versions use a 68KΩ in this application.
Note 5. Some versions use a 150K in this application.
Note 6. Some versions use a 10K, 2 W in this application, also in chassis CU a 82000, 2 W is used in this application.
Note 7. Some versions use a 1Meg in this application.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA							NOTES
		OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No	Ram PART No.	Stancor PART No.	Thordarson PART No	
T1	Horiz. Output Trans.	TR3591-2	PB460 *	HYG-38 *		X129 *①	A-3254 *	FLY-75 *	D-40 * ①
T2	Vert. Output Trans.	TR3888	21S00 ①	A-50K ①	2367X ①	V31X ①	A-8141 ①	26S54 ①	A-104X ①
T3A	Yoke (70°) Horiz. (D. 54QH)	CL3847 ④	DF605 ④	MDP-73 ④	322DL ④	T70P30/43 ④	DY-11A ④	Y-10 ④	Y-32-1 ④
T3A	Vert. (36MH) Yoke (90°) Horiz. (D. 53M)	CL3800-1 ⑤	DF607 ④	MDP-82	355DL ④	T90P19/43 ④	DY-16A	Y-36 ④	Y-41-1
B	Vert. (41MH)								

① Drill new mounting hole(s).
② Use 1Ω to tune ratio.
③ Connect blue lead to plate (pin 6 of V8). Connect red lead of transformer to yellow lead of yoke. Remove green lead of yoke from ground and connect it and green lead of transformer to junction of capacitor C4 and resistor R66.
④ Used in CT chassis only.
⑤ Used in CU chassis only.
⑥ Connect horizontal yoke damping network across terminals #3 and #7. Use original if necessary.
⑦ Remove capacitor from terminals #1 and #3.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
5	5	5		5	5	5	5
4	4	4		4	4	4	6
3	3	3		1	3	3	3

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	OLYMPIC PART No.	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No	
T4	17K	3-4Ω	TR4697	X1900 ①	A-3954 ①	A-3681 ①	84S84 ①	S-51X ①	① Drill new mounting holes.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V C IMP	OLYMPIC PART No.	QUAM PART No.	RCA TYPE No.	
SP1	4"	PM	3-4Ω	SK4342	4A07	22351	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	OLYMPIC PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	1st. Video IF	2Ω		CL2835	19-3286	TV-150	6176	
L2	RF Choke	.1Ω	.1Ω	CL4413	19-1083	TV-158	6319	
L3	2nd. Video IF	.1Ω	.1Ω	CL4413	19-1084	TV-158	6319	
L4	3rd. Video IF							
L5	Series Peaking Coil	5.6Ω		CK4415				6.8 Microhenries, RMC part #CL-1
L6	Series Peaking Coil	8.3Ω		CL1858	19-3180 *	TV-154 *	6180 *	180 Microhenries, wound on 33K resistor
L7	Shunt Peaking Coil	7.8Ω		CL1837	19-3185 ■	TV-183	6176	180 Microhenries, wound on 39K resistor
L8	Series Peaking Coil	7.3Ω		CL3403	19-3300		6155	300 Microhenries
L9	Shunt Peaking Coil	18Ω			19-3500 ■	TV-188	6174 ■	500 Microhenries, wound on 1Meg resistor
L10	1st. Sound IF	7Ω		CL3414				Tapped @ .4Ω and 1.3Ω
L11	2nd. Sound IF Quadrature Coil	3.4Ω		CL4631	19-3412			
L12		2Ω		CL3603-1			1481	

* Parallel with 22K resistor.
■ Parallel with 1Meg resistor.
▲ Parallel with 39K resistor

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA						NOTES
	PRI.	SEC.	OLYMPIC PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L13	31Ω	53Ω	TR3980-1	20-1462 *	TV-162 *	6183 *	208R1 *	H-100 *	HS-8 *	Waveform winding -45Ω

* Reverse coil mounting in can.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE @ CURRENT 1000 "∪"	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No	Thordarson PART No	Triad PART No
L14	.190A	53Ω	.6 HY	CK4047					

SELENIUM RECTIFIER

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CURRENT		OLYMPIC PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.190A		RF-3615-1	1234AH	MR350	6R100	6Q4	300	
M2	.190A		RF-3615-1	1234AH	MR300	6S300	6Q4	300	

FUSES

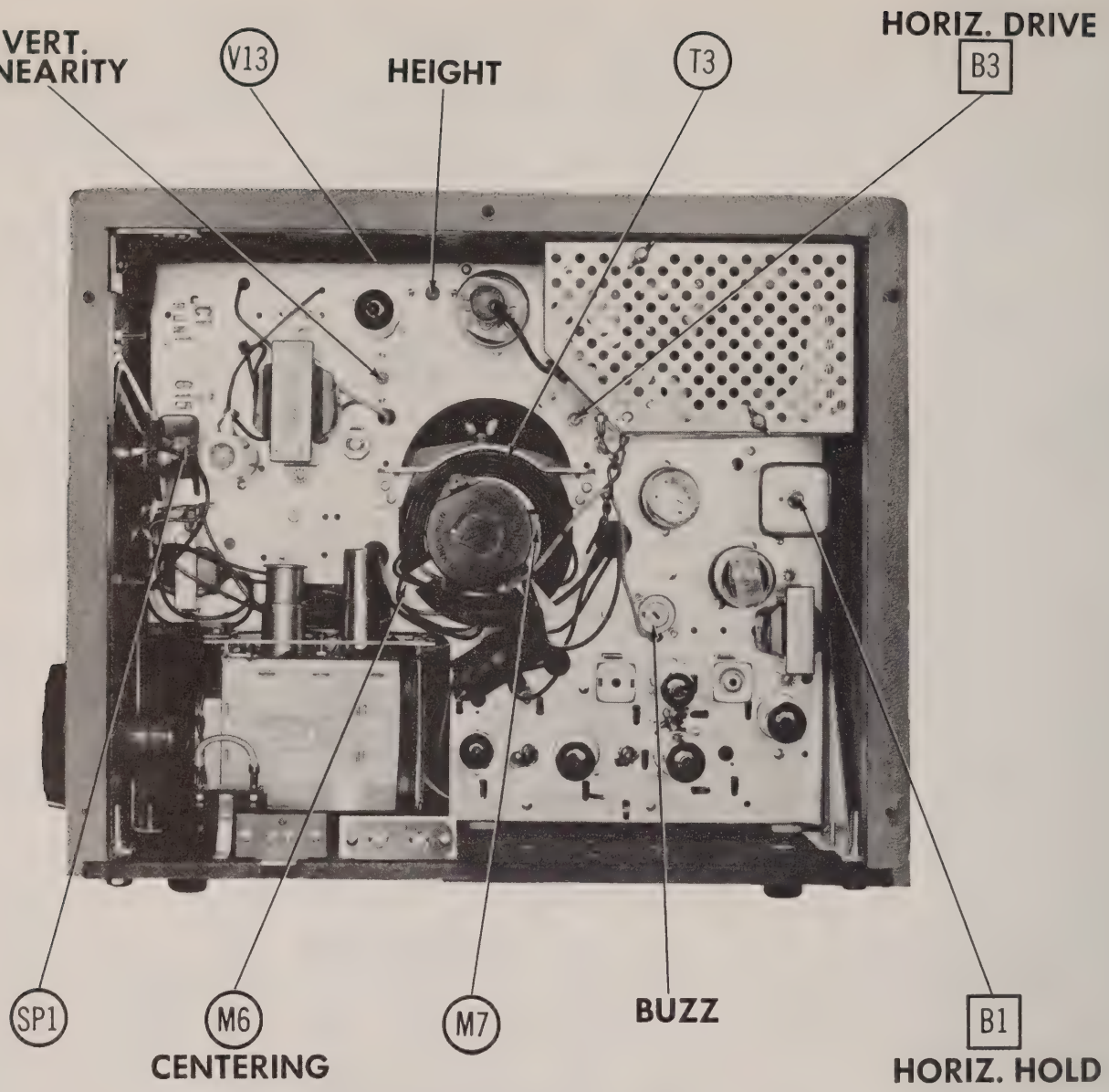
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			OLYMPIC PART No.		LITTELFUSE PART No.		BUSS PART No	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M3	"GC"	3/8A 250V	FU4345	FH4344	352.375 (C 3/8 A)	346002	C 3/8	HCB/10 to 1/2

CRYSTAL DIODES

ITEM No	ORIG. TYPE	REPLACEMENT DATA		NOTES
		OLYMPIC PART No	SYLVANIA PART No	
M4	1N64	1N64	1N60	Video detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	OLYMPIC PART No.	NOTES
M5	Tuner	CL4548	VHF (Pentode) Chassis CT
	Tuner	CL4692	VHF (Pentode) Chassis CU
M6	Centering Device	PP2763	
M7	Ion Trap	PP2523	
B3	Trimmer Cap.	CC2526	Horiz. Drive (10-583MMF)
	Cabinet	CA4706	Model 14TT50
	Cabinet	CA4707	Model 17TU51
	Cabinet	CA4707-1	Model 17TU52
	Cabinet	CA4708	Model 17TU52
	Knob	KN3859-3	Channel selector - Model 14TT50
	Knob	KN4711	Channel selector - Model 17TU52
	Knob	KN4711-1	Channel selector - Model 17TU51
	Knob	KN3171-3	Fine tuning - Model 14TT50
	Knob	KN4712	Fine tuning - Model 17TU52
	Knob	KN4712-1	Fine tuning - Model 17TU51
	Knob	KN3671-2	Control (5 used) Model 14TT50
	Knob	KN4713	Control (5 used) Model 17TU52
	Knob	KN4713-1	Control (5 used) Model 17TU51
	Mask	PP4717	Model 17TU51
	Mask	PP4717-1	Model 17TU51
	Mask	PP4718	Model 14TT50
	Safety Glass	PP4721	Model 14TT50
	Safety Glass	PP4722	Models 17TU51, 17TU52



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern. Connect a short jumper across terminals "C" and "D" of L13.

Set the horizontal hold control fully clockwise. Adjust the horizontal frequency slug (B1) until the picture falls into sync.

Remove the jumper from L13. Connect the vertical amplifier of the scope to terminal "C" of L13 thru a 5MMF capacitor.

Adjust the horizontal phase slug (B2) for a waveform similar to Fig. 3 with broad and narrow peaks of equal amplitude.

If necessary, during the adjustment of B2, keep the picture in sync with the horizontal hold control or B1.

Remove the scope and retouch B1 for the following conditions:

1. At full clockwise position of the horizontal hold control a blanking bar or picture jitter should be visible.

2. At full counter clockwise position of the horizontal hold control the picture should be at the point of losing sync.

Adjust the horizontal drive trimmer (B3) clockwise as far as possible without the presence of vertical white lines or compression near the center of the picture.

If neither of these conditions occur, adjust B3 for a picture slightly wider than necessary to fill the picture mask horizontally.

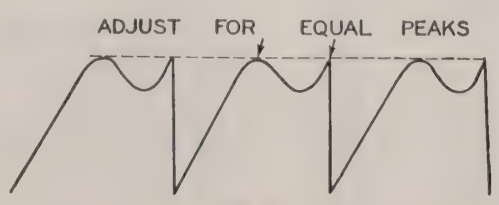


FIG. 3

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PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

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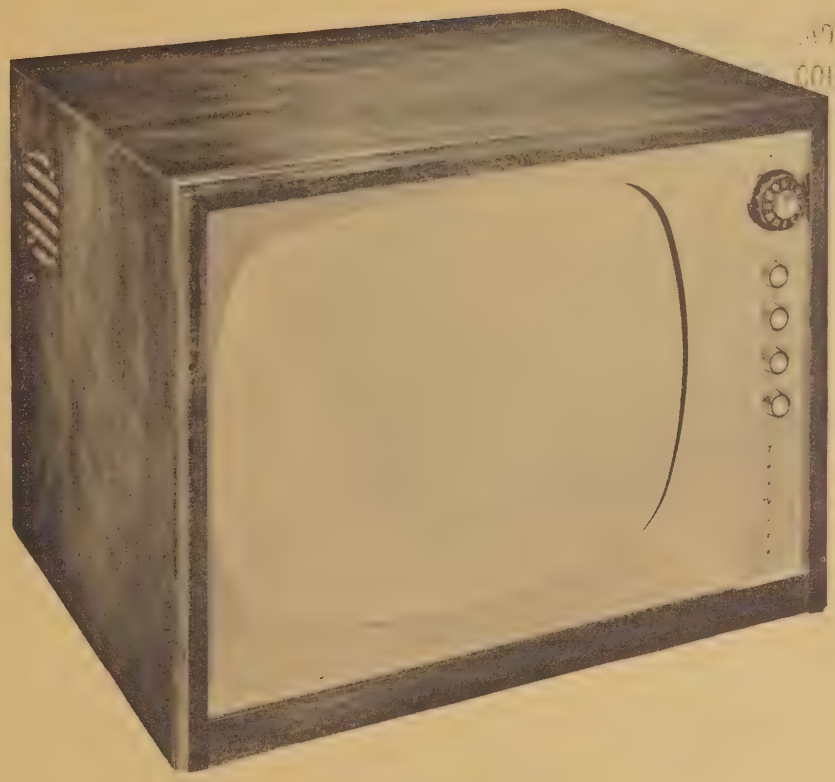

TRAV-LER MODEL 621-30

TRADE NAME	Trav-Ler	MODELS	CHASSIS
		617-33, 617-34, 621-30, 621-31, 621-32, 621-R40 ..... (NOTE: Model 621-R40 employs AM Radio and Phono)	627A6
MANUFACTURER	Trav-Ler Radio & Television Corp., 571 W. Jackson Blvd., Chicago 6, Illinois		
TYPE SET	Television Receiver		
TUBES	Sixteen		
POWER SUPPLY	110-120 Volts AC-60 Cycle	RATING 1.12 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13, Video IF 26.25MC, Sound IF 21.75MC (Intercarrier)		

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TRAV-LER MODELS 617-33, -34, 621-30, -31, -32, -R40 (Ch. 627A6)

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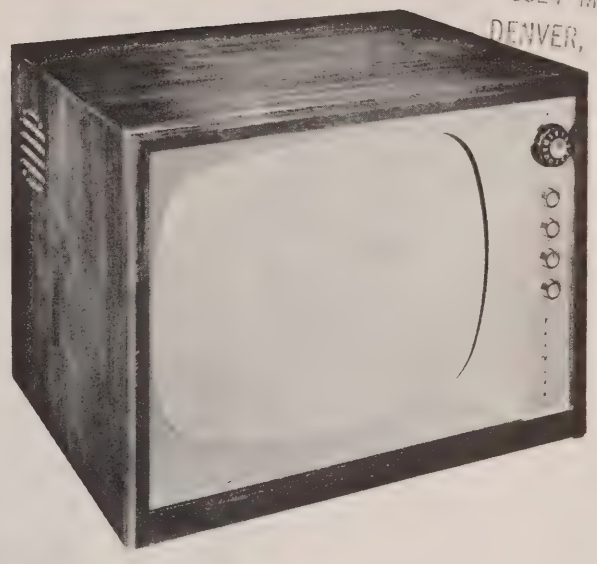

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 6 push-on type control knobs from front panel of cabinet.

2. Remove 9 wood screws. Remove rear cover.

3. Remove 2 wood screws holding antenna terminal bracket.

4. Disconnect picture tube socket, yoke plug, HV lead and speaker leads.

5. Remove 4 chassis wing screws (2 at the top rear of chassis and 2 at the bottom rear of chassis). Slide chassis from cabinet.

6. Remove 4 speaker nuts. Remove speaker.

MODEL	CHASSIS
621-30	627A6

TRAV-LER MODELS 617-33, -34, 621-30, -31, -32, -R40 (Ch. 627A6)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

To adjust the horizontal oscillator, remove the rear cover and supply power to chassis. Set the horizontal hold control at the center of its range and adjust the horizontal frequency slug (L15) until the picture synchronizes horizontally.

SOUND IF DETEC TOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L14) located on top of the chassis.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

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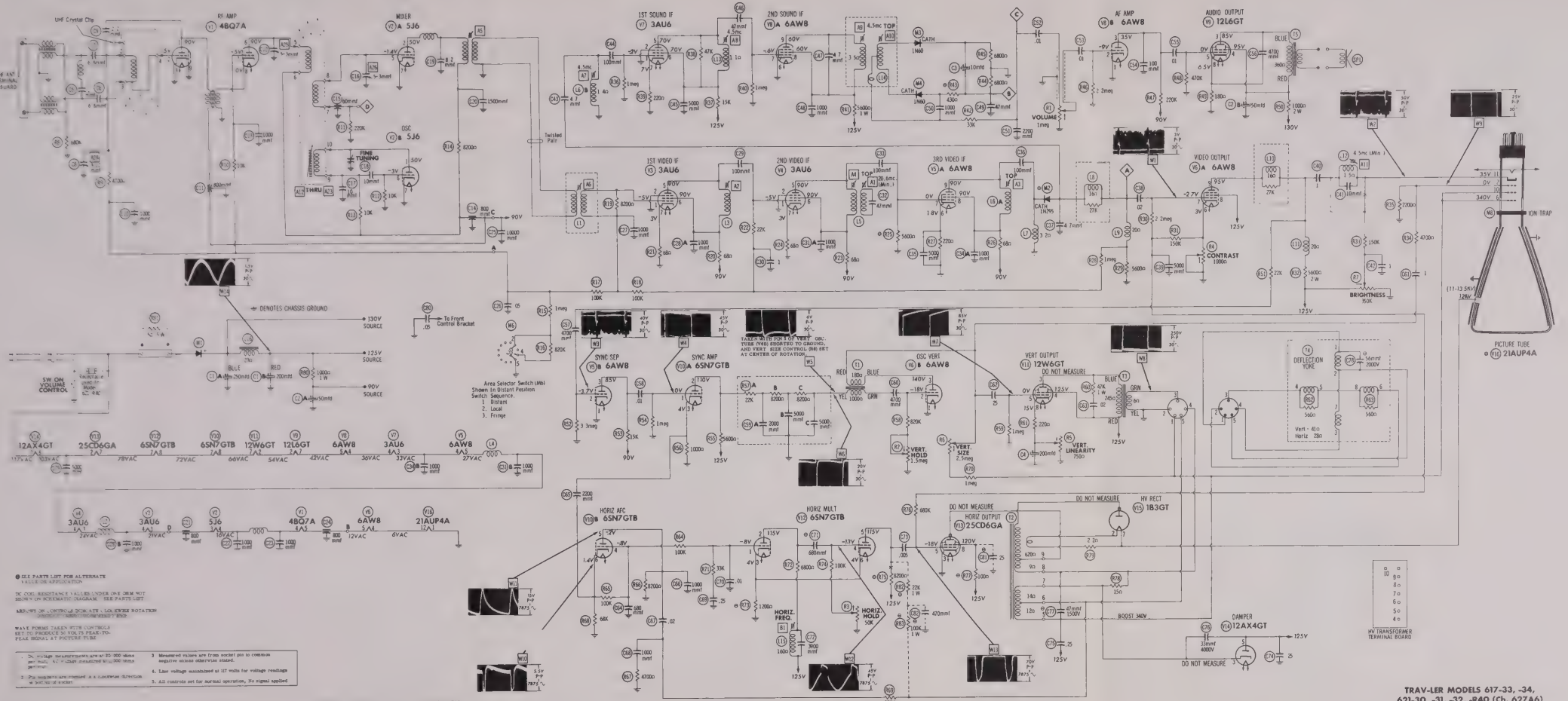

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TRAV-LER MODELS 617-33, -34, 621-30, -31, -32, -R40 (Ch. 627A6)

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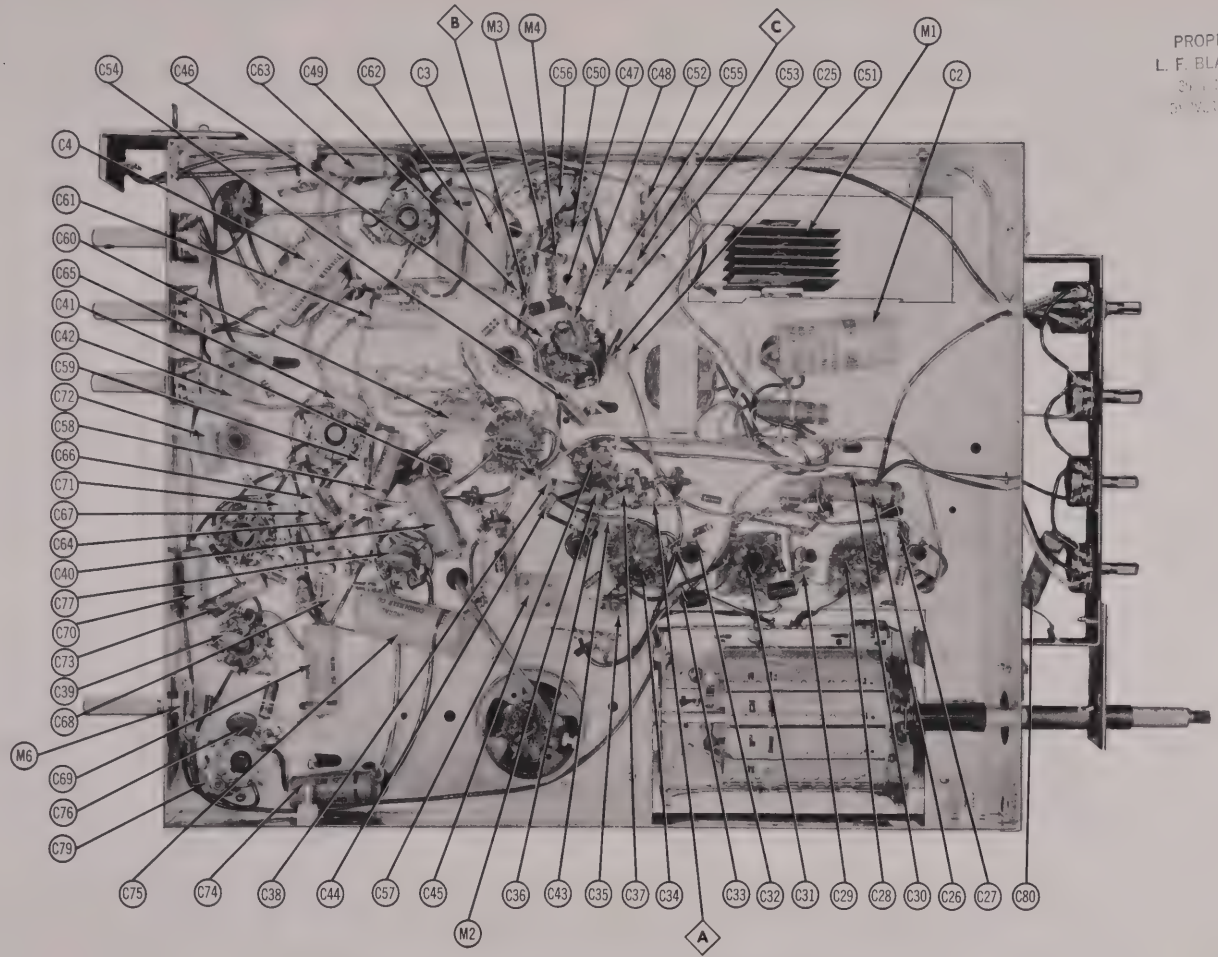

CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

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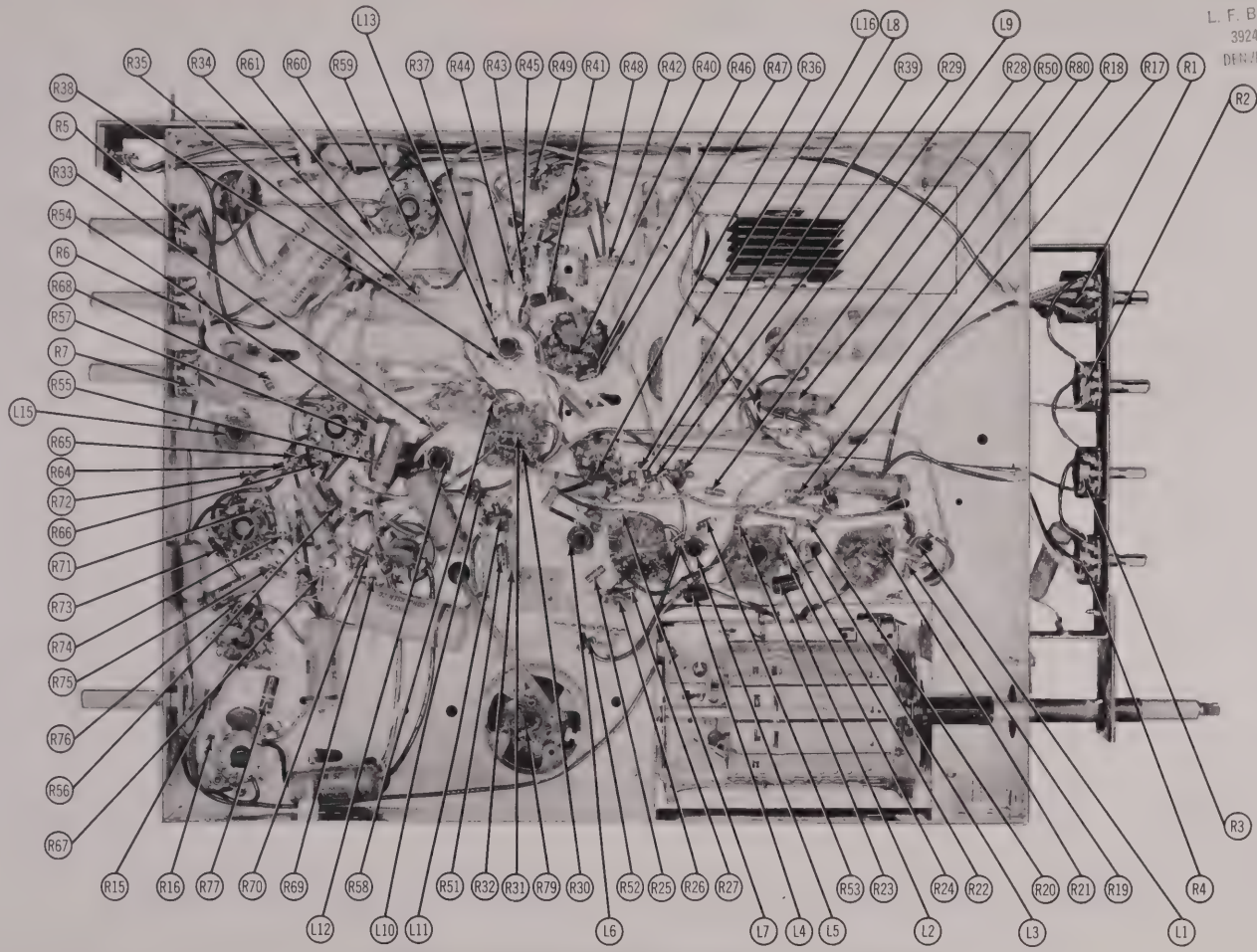

CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TUBE PLACEMENT CHART

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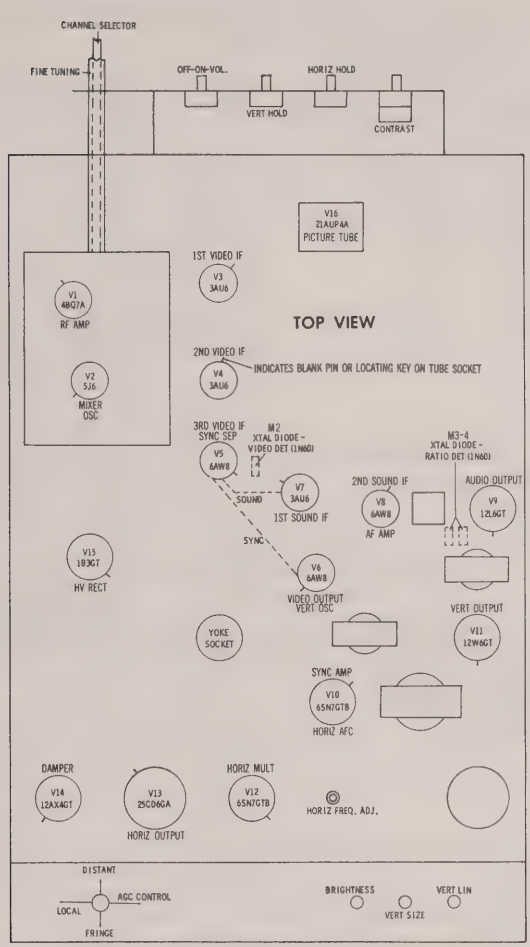


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

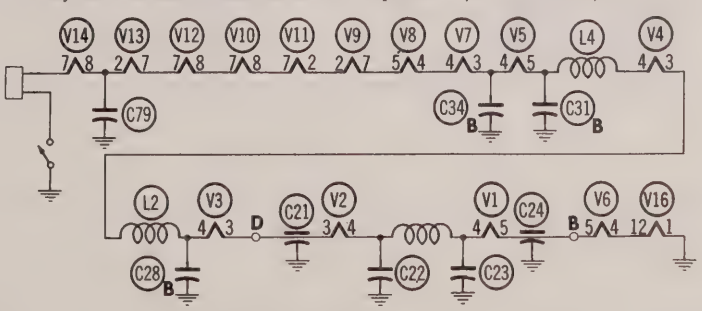
POWER SUPPLY FAILURE
No raster, no sound - Selenium Rectifer (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V16
Has pic, no sound - V7, V8, V9

SYNC FAILURE
No vert. sync - V6, V10
No horiz. sync - V10, V12
No vert. or horiz. sync - V5, V10

SWEEP FAILURE
No raster, has sound - V12, V13, V14, V15, V16
No vertical deflection - V6, V11
Poor vert. linearity or foldover - V6, V11
Poor horiz. linearity or foldover - V12, V13, V14
Narrow picture - V12, V13, V14, V15, M1
Vert. off freq. - V6, V10
Horiz. off freq. - V10, V12

NOTE: Since this receiver employs tubes used in a series filament network, an open filament in any tube in series will cause the set to be inoperative. (See circuit below).



ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis.
Do not remove the horizontal oscillator tube (V12) to disable the high voltage.
Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt battery to the ungrounded side of C30. Connect the positive lead to chassis. Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to pin 1 (grid) of 3AU6 (V3). Low side to chassis.	Not used.	20. 6MC (unmod)	12	USE VTVM. DC probe to point Ⓐ. Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	24MC (10MC Swp)	20. 6MC 21. 75MC 22. 75MC 26. 25MC	Any	Vert. amp. thru 10K to point Ⓐ. Low side to chassis.	A2, A3, A4, A5, A6	If necessary, reduce bias to 1. 5 volts to obtain usable pattern on scope. Adjust A2 thru A6 to obtain response similar to Fig. 1. A2 affects the video side of response and A3 affects the audio side. A4 affects the intermediate range of the response curve. Adjust A5 and A6 for proper symmetry, flatness and bandwidth.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
3.	Direct	High side to point Ⓐ. Low side to chassis.	4. 5MC (unmod)	Any	DC probe to point Ⓑ. Common to chassis.	A7, A8, A9	Adjust for maximum deflection.
4.	"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Direct	High side to point Ⓐ. Low side to chassis.	4. 5MC (450KC Swp)	4. 5MC	Any	Vert. amp. to point Ⓑ. Low side to chassis.	A7, A8, A9	Disconnect stabilizing capacitor C3. Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
4.	"	"	"	"	"	Vert. amp. to point Ⓒ. Low side to chassis.	A10	Reconnect C3. Adjust so that 4. 5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

Set contrast control for maximum.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5.	Direct	High side to point Ⓐ. Low side to chassis.	4. 5MC (unmod)	Any	DC probe thru detector (Fig. 4) to pin 11 (cathode) of picture tube. Common to chassis.	A11	Adjust for MINIMUM deflection.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket. The channel oscillator adjustment screws are reached through a hole just to the left and below the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω carbon resistors.	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211. 25MC 215. 75MC	13	Vert. amp. thru 47K to point Ⓐ. Low side to chassis.	A12	Adjust to place sound marker in trap notch as in Fig. 5. Video marker should fall at 50%.
			207MC (10MC Swp)	205. 25MC 209. 75MC	12		A13	
			201MC (10MC Swp)	199. 25MC 203. 75MC	11		A14	
			195MC (10MC Swp)	193. 25MC 197. 75MC	10		A15	
			189MC (10MC Swp)	187. 25MC 191. 75MC	9		A16	
			183MC (10MC Swp)	181. 25MC 185. 75MC	8		A17	
			177MC (10MC Swp)	175. 25MC 179. 75MC	7		A18	
			85MC (10MC Swp)	83. 25MC 87. 75MC	6		A19	
			79MC (10MC Swp)	77. 25MC 81. 75MC	5		A20	
			69MC (10MC Swp)	67. 25MC 71. 75MC	4		A21	
			63MC (10MC Swp)	61. 25MC 65. 75MC	3		A22	
			57MC (10MC Swp)	55. 25MC 59. 75MC	2		A23	

ALIGNMENT INSTRUCTIONS (cont)

RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Two 120Ω carbon resistors.	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205. 25MC 209. 75MC	12	Vert. amp. thru 10K to point (D). Low side to chassis.	A24, A25, A26	Adjust for response curve similar to Fig. 6 with markers above 90%.
8.	"	"	213MC (10MC Swp)	211. 25MC 215. 75MC	13	"		Check for response similar to Fig. 6. If markers fall below 70% on any channel, make compromise adjustments of A24, A25 and A26 with channel switch set to that channel. Check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199. 25MC 203. 75MC	11			
			195MC (10MC Swp)	193. 25MC 197. 75MC	10			
			189MC (10MC Swp)	187. 25MC 191. 75MC	9			
			183MC (10MC Swp)	181. 25MC 185. 75MC	8			
			177MC (10MC Swp)	175. 25MC 179. 75MC	7			
			85MC (10MC Swp)	83. 25MC 87. 75MC	6			
			79MC (10MC Swp)	77. 25MC 81. 75MC	5			
			69MC (10MC Swp)	67. 25MC 71. 75MC	4			
			63MC (10MC Swp)	61. 25MC 65. 75MC	3			
			57MC (10MC Swp)	55. 25MC 59. 75MC	2			

RADIO ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
9.	.1MFD	High side to antenna section of tuning gang. Low side to B-.	455KC	Radio	Tuning gang fully open.	Across voice coil.	A27, A28 A29, A30	Adjust for maximum.
10.	"	"	1610KC	"	"	"	A31	"
11.	"	"	540KC	"	Tuning gang fully closed.	"	A32	"
12.	"	"	1610MC	"	Tuning gang fully open.	"		Recheck A5 for maximum output.
13.		Loop	1400KC	"	Tune to 1400KC signal.	"	A33	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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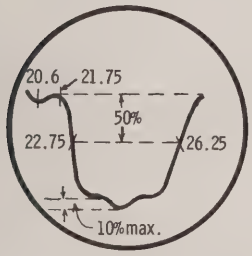


FIG.1

FIG. 2

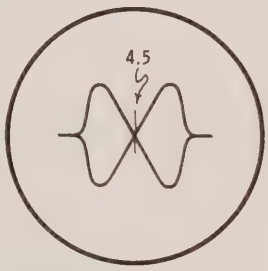


FIG. 3

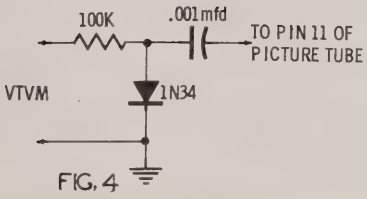


FIG. 4

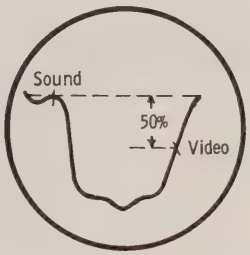


FIG.5

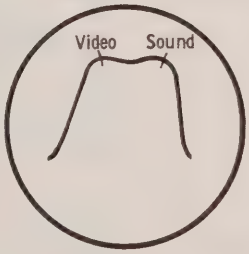
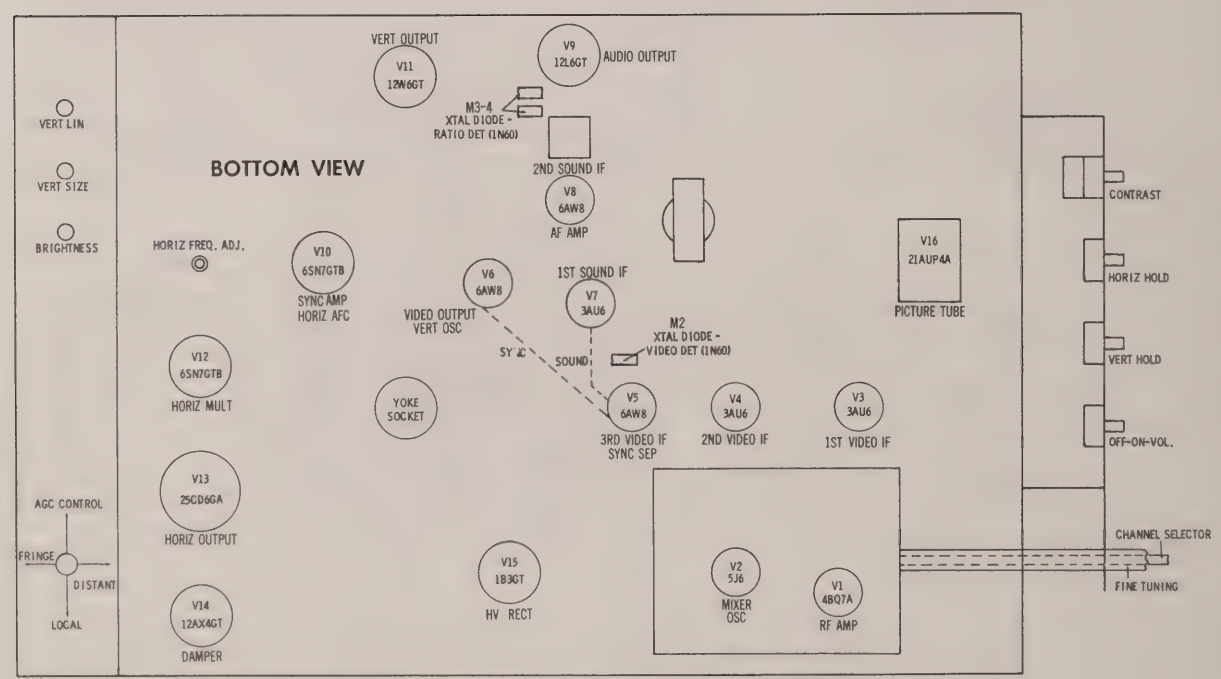


FIG.6

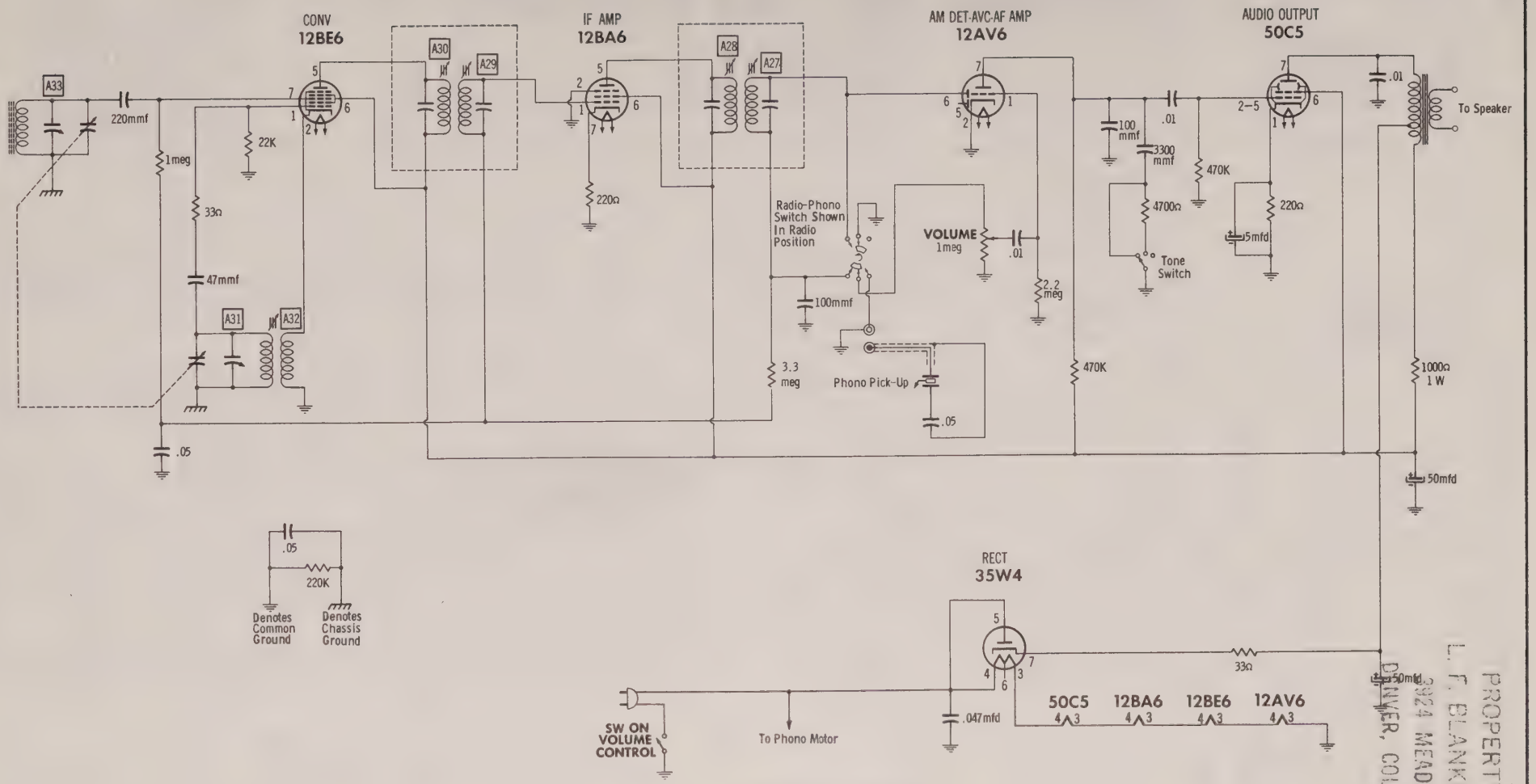
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	4BQ7A	†1000Ω	1.2Meg	0Ω	4Ω	3Ω	†1000Ω	1.2Meg	0Ω	0Ω
V2	5J6	†11K	†9200Ω	5Ω	4Ω	220K	10K	0Ω		
V3	3AU6	1Meg	0Ω	5Ω	6Ω	†1000Ω	†1000Ω	68Ω		
V4	3AU6	1Meg	0Ω	6Ω	7Ω	†1000Ω	†1000Ω	68Ω		
V5	6AW8	0Ω	3.3Meg	†16K	8Ω	7Ω	220Ω	5600Ω	†1000Ω	†1000Ω
V6	6AW8	0Ω	●1.3Meg	▪●1.4Meg	2Ω	3Ω	●50Ω	2.3Meg	†23Ω	†5600Ω
V7	3AU6	1Meg	0Ω	8Ω	9Ω	†15K	†15K	220Ω		
V8	6AW8	0Ω	2.2Meg	†220K	9Ω	10Ω	0Ω	1Meg	†5600Ω	†5600Ω
V9	12L6GT	NC	13Ω	†1400Ω	†1000Ω	470K	NC	10Ω	180Ω	
V10	6SN7GTB	1Meg	†5600Ω	1000Ω	170K	8200Ω	68K	17Ω	15Ω	
V11	12W6GT	TP	13Ω	†270Ω	†23Ω	1Meg	NC	15Ω	●450Ω	
V12	6SN7GTB	270K	†6800Ω	1200Ω	● 120K	†8200Ω	1200Ω	18Ω	17Ω	
V13	25CD6GA	NC	22Ω	0Ω	NC	850K	TP	18Ω	†125Ω	TOP CAP ▪17Ω
V14	12AX4GT	NC	NC	INF	NC	†23Ω	NC	25Ω	22Ω	
V15	1B3GT		PINS	1 - 8	HAVE	INFINITE	RESISTANCE			TOP CAP ▪635Ω
V16	21AUP4A	0Ω	2200Ω	Pin 6 ▪15Ω	Pin 10 ▪ 15Ω	Pin 11 ●†200K	Pin 12 2Ω			

† MEASURED FROM OUTPUT OF M1.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
▪ MEASURED FROM PIN 3 OF V14.
NC NO CONNECTION
TP TIE POINT
ALL MEASUREMENTS TAKEN WITH AREA SELECTOR SWITCH IN "LOCAL" POSITION.



TUBE PLACEMENT CHART



AM Radio Used With Model 621 R40

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PROPERTY OF
L. F. BLANKENSHIP
2924 MEADE ST.
DENVER, COLORADO

RADIO SCHEMATIC

TRAV-LER MODELS 617-33, -34, 621-30, -31, -32, -R40 (Ch. 627A6)

PROPERTY OF
TRAV-LER ELECTRONICSHIP
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amp.	6BH7A	
V2	Mixer-Osc	5J6	
V3	1st Video IF Amp.	3AL6	
V4	2nd Video IF Amp.	3AL6	
V5	3rd Video IF Amp. - 2nd Audio Output	3AL6	
V6	Sync. Separator	6AW8	
V7	Video Output, Vert. Osc.	6AW8	
V8	1st Sound IF Amp.	3AU6	
V9	2nd Sound IF Amp. - AF Amp.	6AW8	
V10	Sync. Amp.-Horiz AFC	12L6GT	
V11	Vert. Output	6SN7GT	
V12	Horiz. Multi.	6SN7GTB	
V13	Horiz. Output	25L6GA	
V14	Damper	12AX4GT	
V15	HV Rectifier	1B3GT	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	Trav-Ler PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V16	21AUP4A	21AUP4A	21AUP4A	21AUP4A	① Aluminized ② Silver Screen "85"
		21AUP4A/B		21AUP4A/B	
		21AUP4A/C		21AUP4A/C	
	17HP4B	17HP4B	17HP4B	17HP4B	
		17HP4, 17RP4	17HP4, 17RP4	17HP4, 17RP4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP	VOLT	REPLACEMENT DATA Trav-Ler PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	250	50	TV-EC-47	PRS-302		WR320	CDB-1015		D-005 MT-1550
C1B	50	150							
C2A	50	150	TV-EC-24A	PRS150V5050	BBRD5515	TCD49	TDL-D50-.50	FMD-1550	TVA-2453
B	150	50							
C3	10	50	TV-EC-20	PRS50V10	BRS05	TC32	TD-10-50	FM-0520	TVA-1504
C4	200	25	TV-EC-49	PRS25Y250	BRH2525	TC50025	TD-250-25	MTH-2525	TVA-1512

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP	VOLT	REPLACEMENT DATA Trav-Ler PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	1			NPO-S31	TCZ-1	T203	NPOA-010		5TCCB-V1	
C6	6.8			NPO-DSL 8	TCZ-6R8	Z013	NPOA-6R8	2T-5568	5TCCB-V68	
C7	6.8			NPO-DSL 8	TCZ-6R8	Z013	NPOA-6R8	2T-5568	5TCCB-Y68	
C8	3-12									
C9	2.1			NPO-S13.2	TCZ-3R2	Z006	NPOA-3R3		5TCCB-V33	
C10	1000			BPD-001	DD-103	K069	S01-001	DC531	S1K-D1	
C11	820									
C12	3-3				S30-3		31S1-01-0R5	CT565A		
C14	1000			BPD-001	DD-102	K068	S01-001	DC531	S1K-D1	
C15	800									
C16	60				S30-3		31S1-01-0R5	CT565A		
C17	10									
C18	10									
C19	6.7			NPO-D3L 3		Z016	NPOA-6R3			
C20	2500			BPD-0015	DD-153	K071	S01-0015	DC531S	S1K-D15	
C21	800									
C22	1000			BPD-001	DD-103	K069	S01-001	DC531	S1K-D1	
C23	1000			BPD-001	DD-103	K069	S01-001	DC531	S1K-D1	
C24	800									
C25	10000			BPD-01	DD-103	K089	S1I-01	DC531	S1K-S	
C26	.05	200		BPD-05	DF-503	CUB3S5		PT615	S1M-P5	
C27	1000		TV-CC-2	BPD-001	DD-102	K068	S01-001	DC531	S1K-D1	
C28A	1000		TV-CC-1	BPD-2XD01	DD-203	K069	S12-001	DCD531	S1K-2D1	
B	1000									
C29	.30	200	TV-CC-5	SI100	D6-101	T234	GP1K-101	UC-531	5GA-T1	
C30	200		TV-CC-3	PSSBN-1	BF-104	CUB21P1		PT401	S1M-P1	
C30A	1000		TV-CC-1	BPD-2XD01	DD-203	K069	S12-001	DCD531	S1K-2D1	
B	1000									
C32	47		TV-CC-12	NPO-S47	D6-470	Z033	S21-470	2T-5547	5TCC-Q47	
C33	200		TV-CC-5	SI100	D6-101	T234	GP1K-101	UC-531	5GA-T1	
C34A	1000		TV-CC-1	BPD-2XD01	DD-203	K069	S12-001	DCD531	S1K-2D1	
B	1000									
C35	5000		TV-CC-3	BPD-005	DD-502	K080	S01-005	DC535	S1K-D5	
C36	100		TV-CC-5	SI100	D6-101	T234	GP1K-101	UC-531	5GA-T1	
C37	4.7		TV-CC-15	NPO-SL4. 7	TCZ-4R7	T207	NPOA-4R7	2T-5547	5TCCB-Y47	
C38	22	600	TV-CC-4	BPD-03	DF-303	CUB4S3	S1T-03	PT613	S1M-S3	
C39	5000		TV-CC-3	BPD-005	DD-503	K080	S01-005	DC535	S1K-D5	
C40	1	600	TV-CC-16	P6SBN-1	DF-104	CUB21P1		PT601	S1M-P1	
C41	100		TV-CC-10	SI100	TC2-10	T209	NP0A-100	2T-541	5TCC-Q1	
C42	1	200	TV-CC-3	P2SBF-1	DF-104	CUB21P1		PT401	S1M-P1	
C43	4.7		TV-CC-15	NPO-SL4. 7	TCZ-4R7	T207	NP0A-4R7	2T-5547	5TCCB-Y47	
C44	5000		TV-CC-3	SI100	D6-101	T234	GP1K-101	UC-531	5GA-T1	
C45	5000		TV-CC-3	BPD-005	DD-502	K080	S1I-005	DC535	S1K-D5	
C46	47		TV-CC-12	S147	GP1K-470	T264	GP1K-470	UC-5447	5GA-Q47	
C47	4.7		TV-CC-15	NPO-SL4. 7	TCZ-4R7	T207	NP0A-4R7	2T-5547	5TCCB-Y47	
C48	1000		TV-CC-1	SI1000	D6-102	T253	GP1K-102	UC-541	5GA-D1	
C49	47		TV-CC-12	S147	D6-470	T259	GP1K-470	UC-5447	5GA-Q47	
C50	1000		TV-CC-7	1464-001		1RSD1	S1J-102	MCB256	MS-321	
C51	2200	500	TV-MC-11	1464-0023		1RSD23		PT611	S1M-S2	
C52	51	500	TV-CC-15	BPD-01	D6-103	CUB4S1	GP3-333-103	PT611	S1M-S1	
C53	51	500	TV-CC-15	BPD-01	D6-103	CUB4S1	GP3-333-103	PT611	S1M-S1	
C54	300	500		SI100	D6-101	5WST1	GP1K-101	MC235	1FM-31	
C55	51	500	TV-CC-15	BPD-01	D6-103	CUB4S1	GP3-333-103	PT611	S1M-S1	
C56	4700	75	TV-MC-25	BPD-0047		1RSD47	K079	UC-5547	5EK-D47	
C57	4700			BPD-0047		1RSD47	1WSD47	S1I-0047	UC-5547	1FM-247
C58	51	600	TV-PC-15	BPD-01	D6-103	CUB4S1	GP3-333-103	PT611	S1M-S1	
C59A	2000							DC525		
B	5000		TTV-CC-28	TPA-U30		2PC-100	1U2T5M1	7140S-01	DC525	TV-1
C	5000							DC525		
C60	4700	500		1464-0047			1RSD47		MS-247	
C61	1		TV-PC-3	P1SBN-1		DF-104	CUB21P1		PT401	S1M-P1
C62	.25	200	TV-PC-4	P2SBN-25			CUB21P25		PT403S	S1M-P25
C63	.02	500	TV-PC-14	BPD-02		DF-303	CUB4S2	S1T-02	PT613	S1M-S2
C64	680	500		1464-00068		D6-681	1RST68	S1I-681		MS-368
C65	2200	500	TV-MC-12	1464-0023			1RSD23			MS-323
C66	1000		TV-CC-1	SI1000		D6-102	TP53	GP3L-102	UC-531	5GA-D1
C67	.02	600	TV-PC-14	BPD-02		DF-303	CUB4S3	S1T-03	PT613	S1M-S3
C68	1000		TV-CC-1	SI1000		D6-103	TP53	GP3L-102	UC-531	5GA-D1
C69	.25	600	TV-PC-4	P6SBF-25			CUB21P25		PT403S	2TM-P25
C70	.01	600	TV-PC-15	BPD-01		D6-103	CUB4S1	GP3-333-103	PT611	S1M-S1
C71	680	500	TV-MC-15	1464-00068		D6-681	1RST68	S1I-681		MS-368

Note 2

Note 3

Note 4

Note 5

Note 6

Note 7

Note 8

Note 9

Note 10

Note 11

Note 12

Note 13

CAPACITORS (cont)

ITEM No.	RATING CAP	VOLT	Trav-Ler PART No.	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C72	3900	500	TV-MC-12	1464-0039		1RSD39		MCB483	MS-339	
C73	005	600		BPD-075	D6-503	CUB5D5	GP3-333-502	PT625	S7M-D5	
C74	25	200	TV-PC-4	P2SBN-25		CUB2P25		PT403S	2TM-P25	
C75	25	600		P6SBF-25		CUB2P25		PT603S	2TM-P25	
C76	33	4000		HVD-6G-33		DD30-470	6KV-330		30GA-Q33	
C77	47	1500		HVD-15-47	D30-470	Y3Q47	1R5KV-470	DC30447	30GA-Q47	
C78	56	2000			DD30-560				30GA-Q56	Note 1
C79	5000		TV-CC-3	BPD-005	DD-503	K080	S1I-005	DC535	5SK-D5	
C80	05	600		BPD-05	DF-503	CUB5S5		PT615	S7M-S5	
C81	.25	200		P2SBN-25		CUB3P25		PT3025	2TM-P25	Note 3
C82	470			BPD-00047	DD-471	K080	S1I-471	UC-5547	5GA-T47	Note 3

† Items C58A, C59B, C59C, R57A, R57B and R57C are combined in one unit.
Note 1: Some versions may use 47MMF unit in this application.
Note 2: Some versions may use 1000MMF unit in this application.
Note 3: Not used in some versions.

CONTROLS

ITEM No.	RATING RESIST ANCE	WATTS	REPLACEMENT DATA Trav-Ler PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	TV-VC-51	AB-V7	A47-1Meg-Z	Q15-157	U51	Volume
B	Shaft		Not Req.	AK-4	KSB-1	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	KS-1	SWR-12	78-1	U3-28	Attach to R1A
R2A	1.5Meg	½	TV-VC-53	AB-Y3	A47-1.5Meg-S	Q15-158	TA15L	Vert. Hold
B	Shaft		Not Req.	AK-4	KSB-3	Not Req.	Not Req.	Attach to R2A
R3A	50K	½	VC-78	AB-31	A47-50K-S	Q15-153	TA15L	Horiz. Hold
B	Shaft		Not Req.	AK-4	KSB-3	Not Req.	Not Req.	Attach to R3A
R4A	10000	½	VC-81	AB-S	A47-1000-S	Q15-108	TA15L	Contrast
B	Shaft		Not Req.	AK-4	KSB-3	Not Req.	Not Req.	Attach to R4A
R5A	750Ω	½	VC-77	AB-5	A47-750-S	Q15-105	PTA7SL	Vert. Linearity
B	Shaft		Not Req.	AK-19	TQ	Not Req.	Not Req.	Attach to R5A
R6A	2.5Meg	½	VC-78	AB-S3	A47-2.5Meg-S	Q15-339	SU-565	Vert. Size
B	Shaft		Not Req.	AK-19	TQ	Not Req.	Not Req.	Attach to R6A
R7A	300K	½	VC-74	AB-S9	A47-300K-S	Q15-132	TA15L	Brightness
B	Shaft		Not Req.	AK-1	RM-3	Not Req.	Not Req.	Attach to R7A

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	WATT	REPLACEMENT DATA Trav-Ler PART No.	IRC PART No.	NOTES
R8	680K			BTS-680K	
R9	470K			BTS-470K	
R10	10K			BTS-10K	
R11	220K			BTS-220K	
R12	10K			BTS-10K	
R13	10K			BTS-10K	
R14	82000			BTS-8200	
R15	1Meg		TV-IR-105	BTS-1Meg	
R16	820K		TV-IR-116	BTS-820K	
R17	100K		TV-IR-43	BTS-100K	
R18	100K		TV-IR-43	BTS-100K	
R19	8200Ω		TV-IR-80	BTS-8200	
R20	68Ω			BTS-68	
R21	68Ω			BTS-68	
R22	22K		TV-IR-45		
R23	68Ω			BTS-68	
R24	68Ω			BTS-68	
R25	5600Ω		TV-IR-83	BTS-5600	Note 1
R26	68Ω			BTS-68	
R27	2200		TV-IR-5	BTS-220	
R28	1Meg		TV-IR-105	BTS-1Meg	
R29	5600Ω		TV-IR-83	BTS-5600	
R30	2.2Meg		TV-IR-13	BTS-2.2Meg	
R31	150K		TV-IR-48	BTS-150K	
R32	5600Ω	2	TV-IR-123	BTS-5600	
R33	150K		TV-IR-48	BTS-150K	
R34	4700		TV-IR-48	BTS-4700	
R35	2200		TV-IR-87	BTS-2200	
R36	1Meg		TV-IR-105	BTS-1Meg	Note 3
R37	15K		TV-IR-65	BTS-15K	
R38	47K		TV-IR-49	BTS-47K	Note 5
R39	220Ω		TV-IR-5	BTS-220	
R40	1Meg		TV-IR-105	BTS-1Meg	Note 2
R41	5600Ω	1		BTA-5600	
R43	4300	½	TV-IR-58	BTS-330K	
R43	4300 ½			BTA-430 5%	Note 2
R44	6800Ω		TV-IR-78	BTS-6800	
R45	6800Ω		TV-IR-78	BTS-6800	Note 5
R46	2.2Meg		TV-IR-13	BTS-2.2Meg	Note 5

ITEM No.	RATING OHMS	WATT	REPLACEMENT DATA Trav-Ler PART No.	IRC PART No.	NOTES
R47	330K		TV-IR-91	BTS-220K	
R48	470K		TV-IR-11	BTS-470K	
R49	180Ω			BTS-180	
R50	1000Ω	½		BTS-1000	
R51	22K		TV-IR-45	BTS-22K	
R52	3.3Meg			BTS-3.3Meg	
R53	15K		TV-IR-63	BTS-15K	
R54	1Meg		TV-IR-105	BTS-1Meg	
R55	5600Ω		TV-IR-83	BTS-5600	
R56	1000Ω			BTS-1000	
R57A	22K			BTS-22K	
B	8200Ω		TTV-CC-36	BTS-8200	
C	6200Ω			BTS-6200	
R58	8200 5%		TV-IR-118	BTS-8200K 5%	
R59	1Meg		TV-IR-105	BTS-1Meg	
R60	47K	1	TV-IR-39	BTA-47K	
R61	330Ω		TV-IR-5	BTS-330	
R62	560Ω				
R63	560Ω				
R64	100K		TV-IR-43		
R65	100K		TV-IR-43		
R66	8200Ω		TV-IR-80		
R67	47000		TV-IR-40	BTS-4700	
R68	680K		TV-IR-91		
R69	330K		TV-IR-91		
R70	1Meg		TV-IR-105	BTS-1Meg	
R71	33K		TV-IR-58		
R72	6800Ω		TV-IR-78		
R73	1200Ω				
R74	100K		TV-IR-43		
R75	8200Ω		TV-IR-80		
R76	680K				
R77	100Ω		TV-IR-104		
R78	15Ω				
R79	1.2Ω 5%		TV-WR-21	BWI-2.2 5%	
R80	1000Ω	1		BTA-1000	
R81	5Ω	5	TV-F-6		
R82	22K	1			
R83	100K	1			

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA Trav-Ler PART No.	Hallodrson PART No.	Merit PART No.	RCA TYPE No.	Rom PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	Vert. Osc. Trans.	TV-TR-22	B6702	A-3003	20V71 ①	V40S	A-8125	26A03	A-97X
T2	Horiz. Output Trans.	TV-TR-20	FB41④⑤	BV0-38④⑤	6235Y1④⑤	X054④⑤	A-8280④⑤	FLY-4④⑤	50④⑤
T3	Horiz. Output Trans.	TV-TR-21	21000 ②	A-3221 ②		Y31④	A-8147④	26870 ①	A-104④②
T4A	Yoke-Horiz. (20MB)	TV-L-7I	DF605 ③⑤	MDF-13 ③	122D1 ③ ⑤	Y70F20/43 ③⑤	DY-11A ③⑤	Y-10 ③⑤	Y-22-A ③⑤
B	Vert. (43MB)								

① Drill new mounting hole(s).
② Use 6 to 1 turns ratio.
③ Connect blue lead to plate (pin #3 of V11); connect green lead of trans. to yellow lead of yoke (yoke socket pin #3). Remove black lead of yoke (yoke socket pin #2) from ground and connect it and red lead of trans. to pin #4 of V11 (B+).
④ Connect blue lead to plate (pin #3 of V11); connect black lead of trans. to yellow lead of yoke (yoke socket pin #3). Remove black lead of yoke (yoke socket pin #2) from ground and connect it and red lead of trans. to pin #4 of V11 (B+).
⑤ May require new centering device.
⑥ Use original horiz. yoke damping network.
† This part may be superceded by Parts Manufacturer's introduction of special unit for this application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	SEC.	REPLACEMENT DATA Trav-Ler PART No.	Hallodrson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	4.5K	3-4Ω	AT-16	21U07	A-3930	A-3880	24S80	S-5X	

SPEAKER

ITEM No.	RATINGS SIZE	FIELD	V C	IMP	REPLACEMENT DATA Trav-Ler PART No.	QUAM PART No	RCA TYPE No	NOTES
SP1	5	PM		3-4Ω	SPK-36	8A0T	5J8G3	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	SEC.	REPLACEMENT DATA Trav-Ler PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	1st Video IF	.1Ω	.6Ω	TV-L-74				
L2	Fil. Choke	0Ω			19-1001		4804	1.6 Microhenries
L3	2nd Video IF	.4Ω		TV-L-75	17-1063		6171-A	
L4	Fil. Choke	0Ω			19-1001		4804	1.6 Microhenries
L5	3rd Video IF	.4Ω		TV-L-73				Includes 31.25MC trap.
L6A	4th Video IF	.7Ω		TV-L-72				
B	1st Sound IF	1.4Ω						
L7	RF Choke	3.2Ω		TV-L-30	19-1005		4813	11 Microhenries
L8	Series Peaking Coil	16Ω		TV-L-66	19-1300*	TV-190*	6132*	330 Microhenries, Wound on 27K resistor.
L9	Shunt Peaking Coil	22Ω		TV-L-66	19-1360		6148	680 Microhenries
L10	Series Peaking Coil	16Ω		TV-L-66	19-1300*	TV-190*	6132*	330 Microhenries; Wound on 27K resistor
L11	Shunt Peaking Coil	30Ω		TV-L-66	19-1360		6148	680 Microhenries
L12	4.5MC Trap	L. 9Ω		TV-L-100	19-1005	TV-151	4813	
L13	2nd Sound IF	L. 1Ω		TV-L-96C				
L14	Ratio Det.	L. 5Ω	L. 6Ω CT	TV-L-17	17-1497	TV-115	6305	Tertiary winding = .8Ω

* Parallel with 27K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES PRI.	SEC.	REPLACEMENT DATA Trav-Ler PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No	Rom PART No.	Thordarson PART No.	NOTES
L15	160Ω		TV-L-84	19-1576	TV-163	6310			H3-5	

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE @ CURRENT 1000 (%)	REPLACEMENT DATA Trav-Ler PART No	Hallodrson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No
L16	.270A	23Ω	.6H	FC-3				28C44 ①	C-23X ①

① Drill one new mounting hole.

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	Trav-Ler PART No.	FEDERAL PART No.	REPLACEMENT DATA INTERNATIONAL RECTIFIER PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M1	.310A	SR-7	1241A	RS400	S8400	684	400	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA Trav-Ler PART No.	SYLVANIA PART No.	NOTES
M2	1N295*	TV-SC-1	1N60	Video Det. (Pigtail)
M3	1N60	TV-SC-1	1N60	Ratio Det. (Pigtail)
M4	1N60	TV-SC-1	1N60	Ratio Det. (Pigtail)

* Some versions may use crystal diode type 1N60 in this application.

MISCELLANEOUS

ITEM No.	PART NAME	Trav-Ler PART No.	NOTES
M5	Tuner	TV-TA-27	VHF
M6	Switch	TV-SW-19	Area Selector (BP - 3 Position; Rotary, Wafer Type)
M7	Centering Device		Part of Deflection Yoke (T4) Rear Cover
M8	Ion Trap	TV-MA-7	
Knob		TV-K-194	Channel Selector
Knob		TV-K-195	Fine Tuning
Knob		TV-K-196	(On-Off-Volume), Vertical Hold, Horiz. Hold, Contrast
Knob		TV-K-197	Shaft Extensions
Knob		K-197	Radio (On-Off-Volume), Radio-Phono Switch, Tone, Tuning. Used in model 621-R40 only.
Dial Pointer		DI-15	Radio. Model 621-R40 only.
Safety glass		TV-DW-56T	Model 621-R40.
Safety Glass		TV-DW-62T	Models 621-30, 621-31, 621-32.
Safety Glass		TV-DW-64T	Models 617-33, 617-34.
Mask		TV-MP-58	Model 621-R40.
Mask		TV-MP-70	Models 621-30, 621-31, 621-32.
Mask		TV-MP-71	Models 617-33, 617-34.

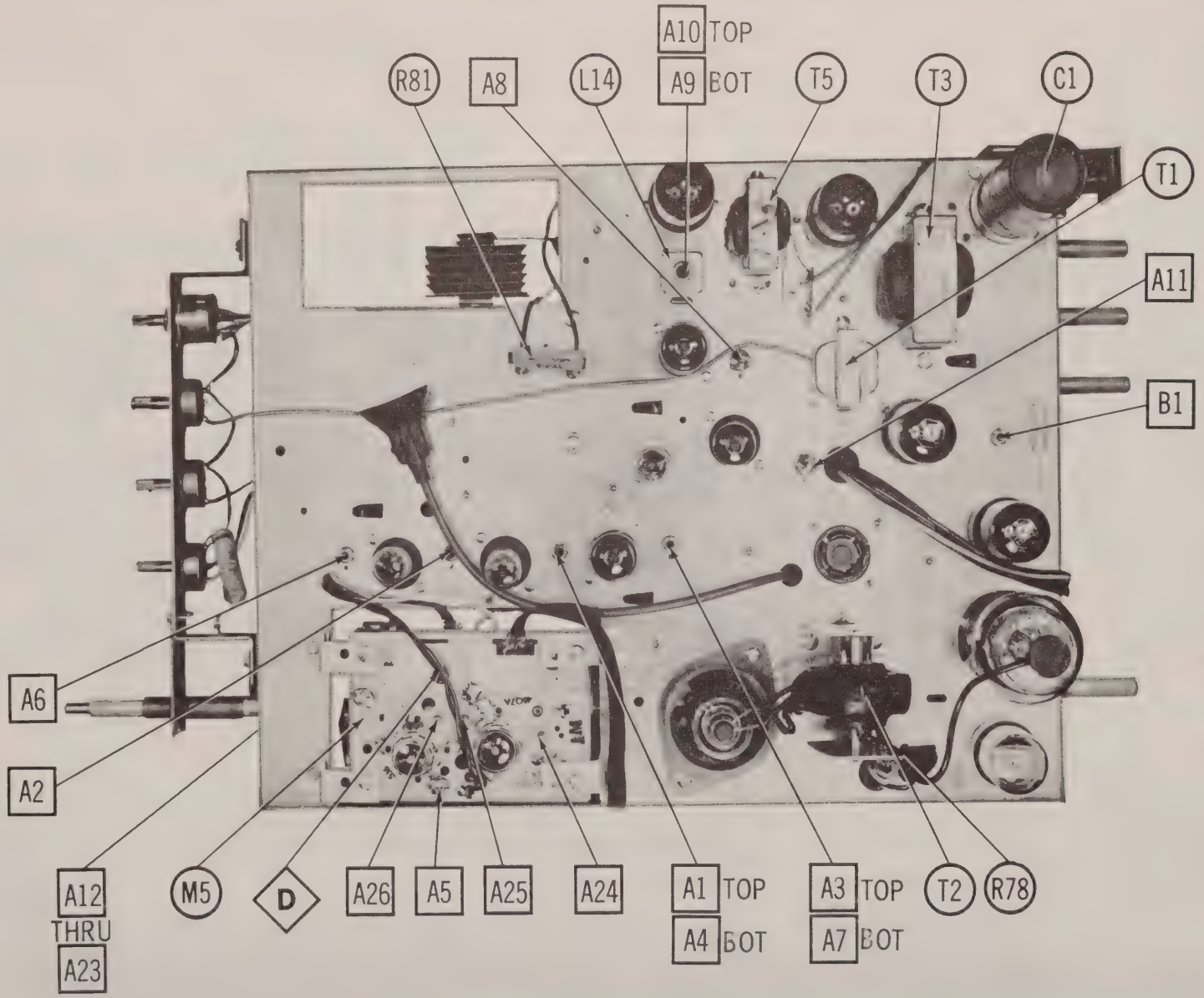
TRAV-LER MODELS 617-33, -34, 621-30, -31, -32 -R40 (Ch. 627A6)

***HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA**

Use Original Width Coil Unless Replacement Type Is Listed

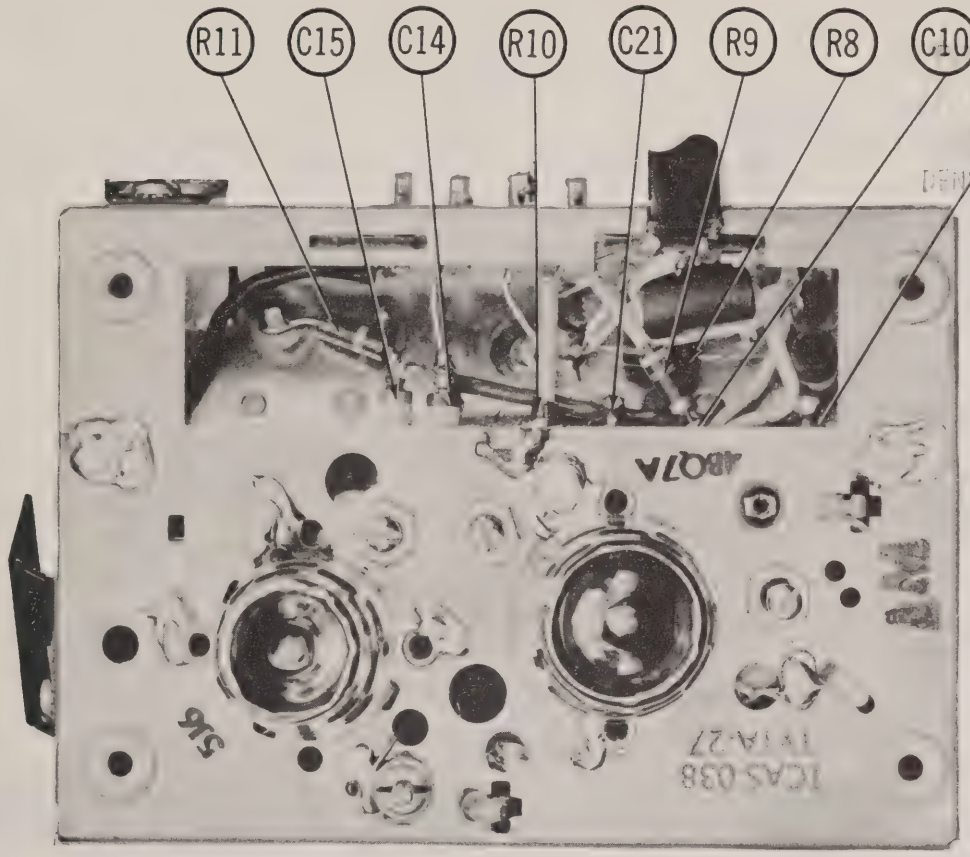
	ORIGINAL TERMINAL CONNECTIONS	Hallodrson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Rom Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	9	9	9	9	9	9	9	9
	8	7	7	7	7	2	7	7
	7	2	2	2	2	7	2	2
	6	N. C. See Note ②	N. C. See Note ②	N. C. See Note ②	N. C. See Note ②	N. C. See Note ②	N. C. See Note ②	N. C. See Note ②
	5	1	1	1	1	1	1	1
	4	5	5	5	5	5	5	5
	3	6	6	6	6	6	6	6
	2	4	4	4	4	4	4	4
	1	3	3	3	3	3	3	3
Special Notes		①	①	①	①	①	①	①

① To reduce yoke "ringing", remove capacitor C78 from horiz. yoke terms #1 and #8 and connect it (in series with 1000Ω) across horiz. yoke terms #3 and #7.

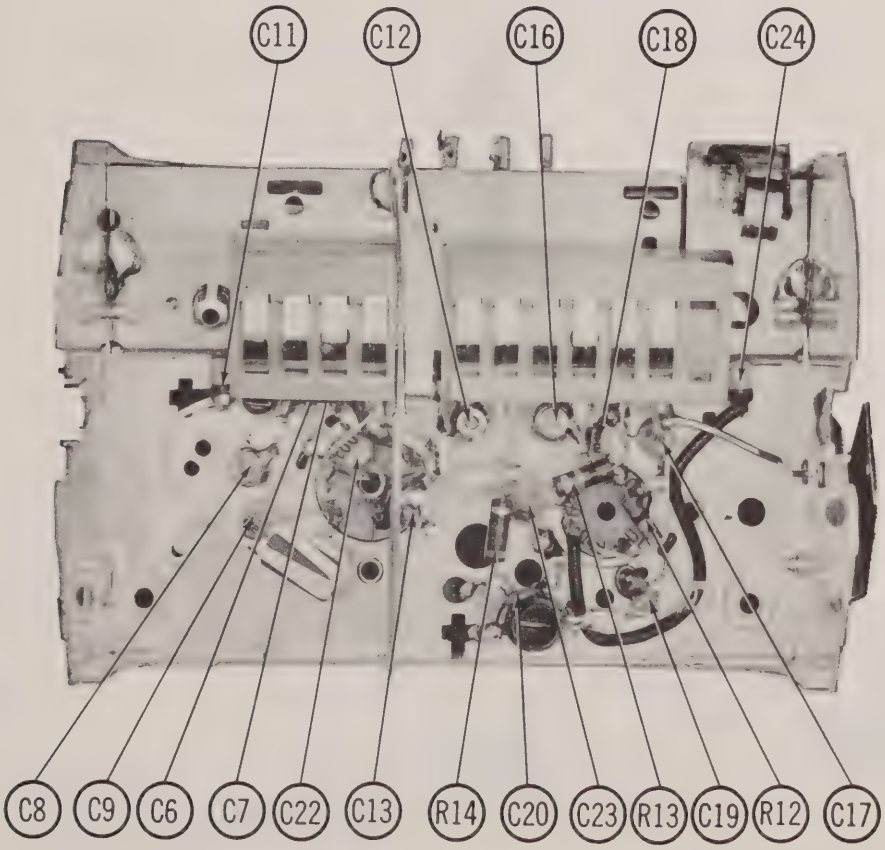


CHASSIS TOP VIEW

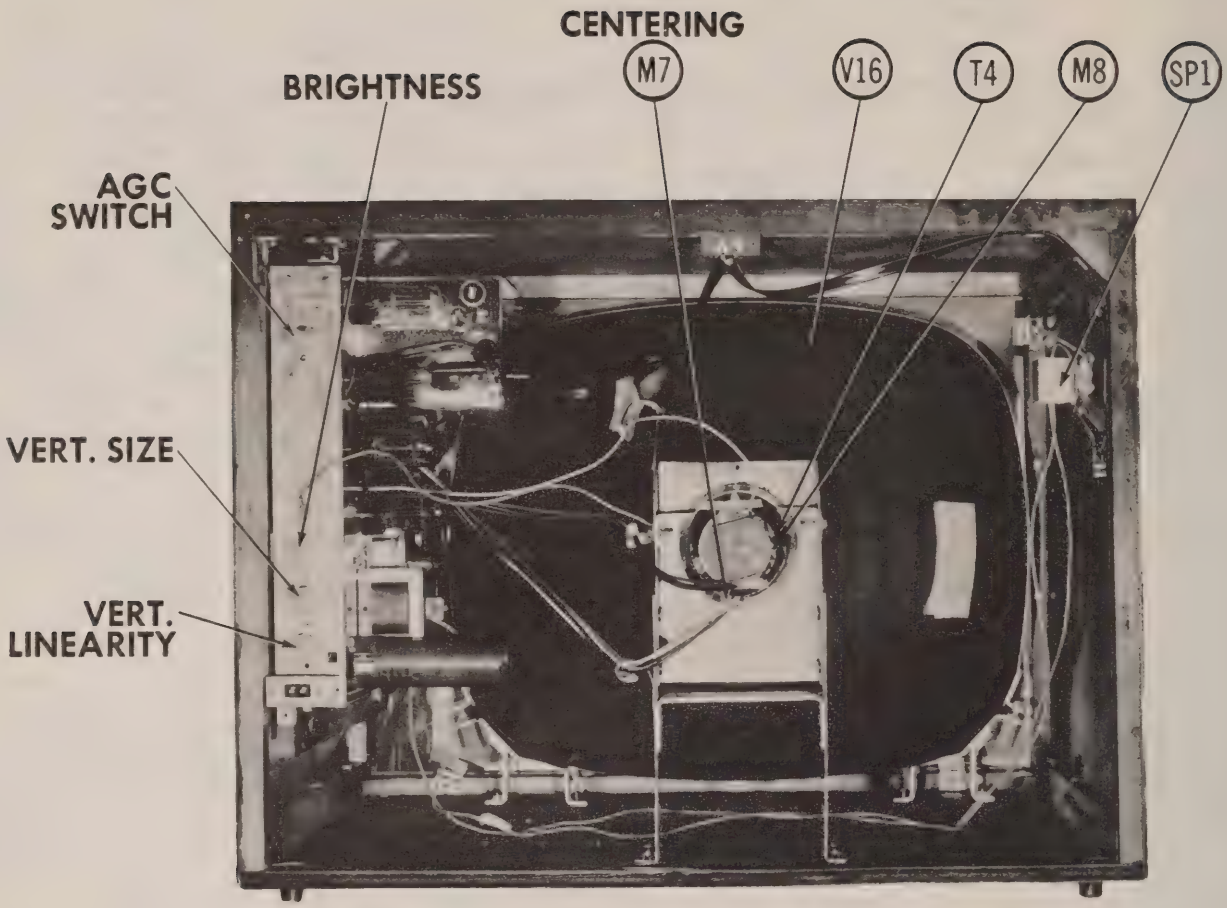
OF
BLANKENSHIP
MEADE ST.
DENVER, COLORADO



RF TUNER-TOP VIEW



RF TUNER-BOTTOM VIEW

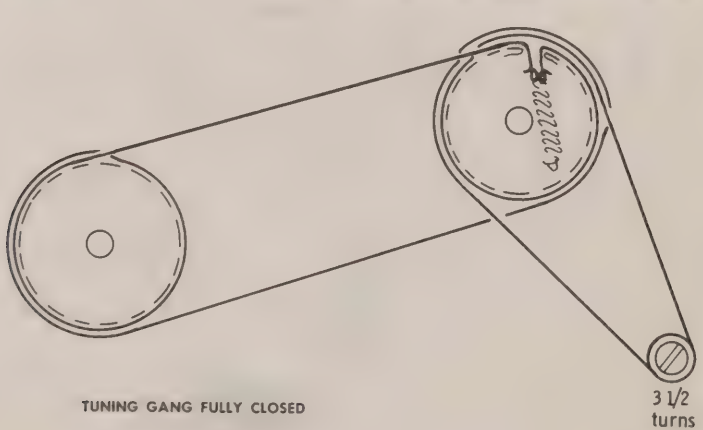


CABINET—REAR VIEW

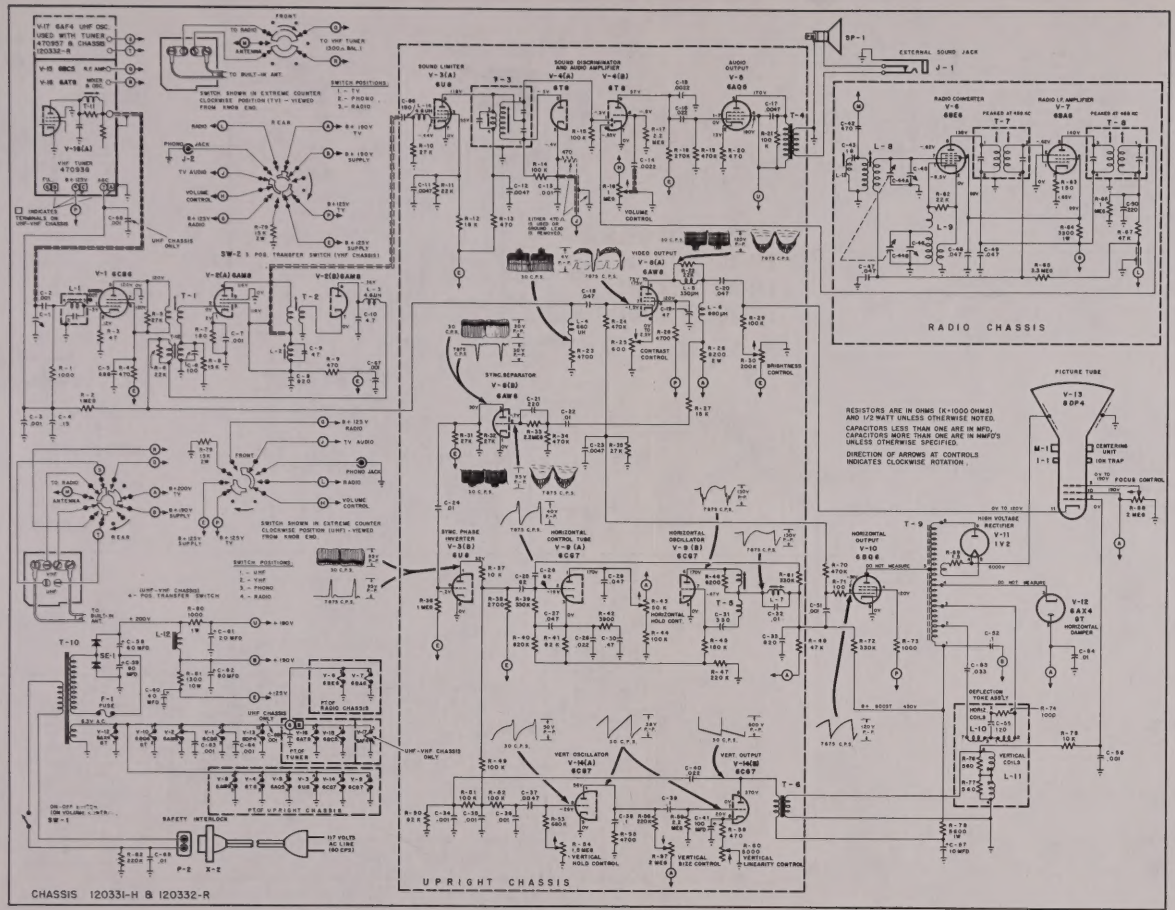
HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.
Set the horizontal hold control at the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Momentarily remove the signal by switching off channel and back again. If the picture does not pull into sync slightly retouch B1. Repeat this procedure until proper sync action is obtained.

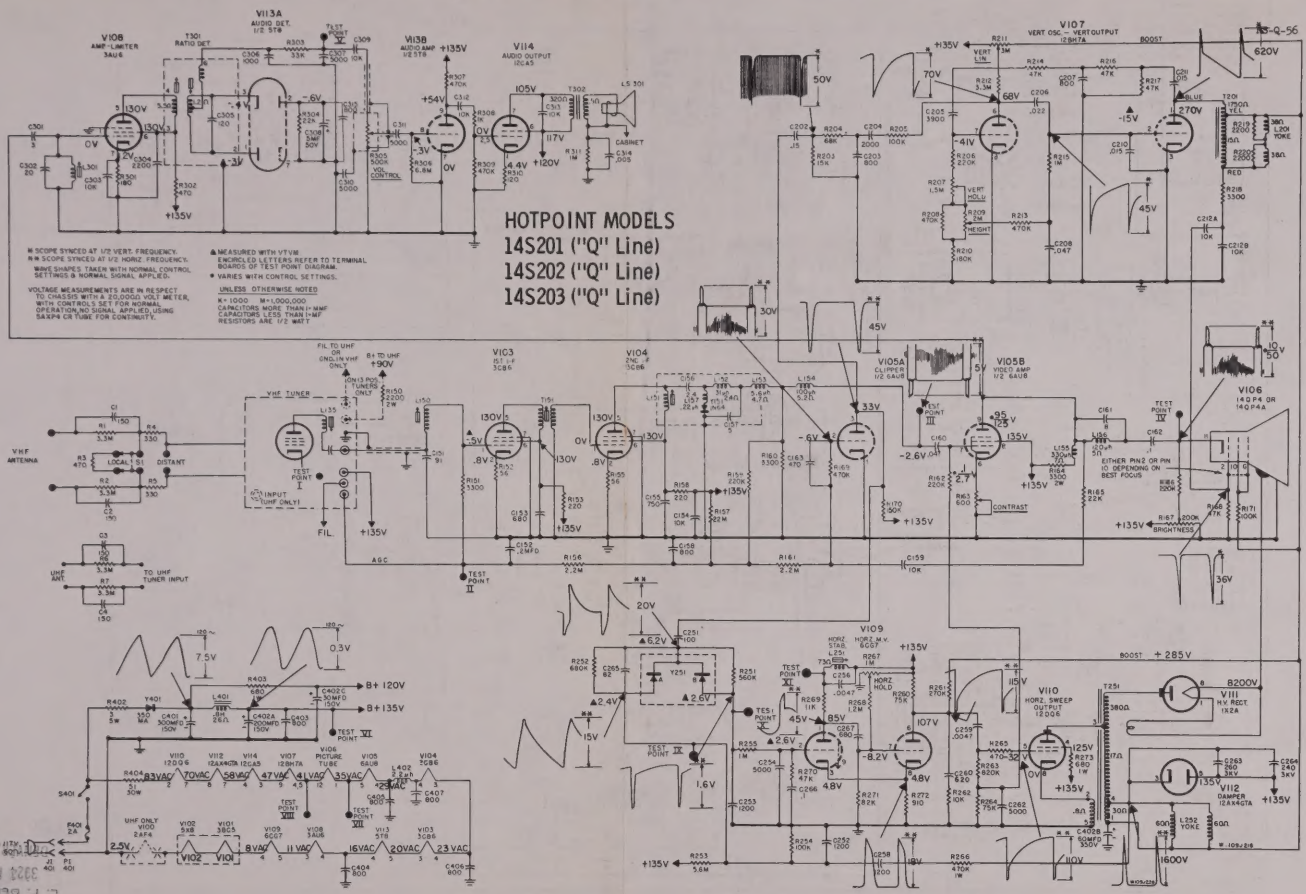


RADIO DRIVE CORD STRINGING


RADIO CHASSIS
UPRIGHT CHASSIS
CHASSIS 120331-H & 120332-R
RESISTORS ARE IN OHMS (K=1000 OHMS) AND 1/2 WATT UNLESS OTHERWISE NOTED.
CAPACITORS LESS THAN ONE ARE IN MFD. CAPACITORS MORE THAN ONE ARE IN MMFD'S UNLESS OTHERWISE SPECIFIED.
DIRECTION OF ARROWS AT CONTROLS INDICATES CLOCKWISE ROTATION.
SW-2 5 POS. TRANSFER SWITCH (VHF CHASSIS)
4- POS. TRANSFER SWITCH
SAFETY INTERLOCK
117 VOLTS AC LINE (60 CPS)
EXTERNAL SOUND JACK
PICTURE TUBE
HORIZONTAL OUTPUT V-10 6BQ6
HIGH VOLTAGE RECTIFIER V-11 1V2
DEFLECTION YOKE ASSY
VERTICAL COILS
VERT. OSCILLATOR V-14(A) 6C97
VERT. OUTPUT V-14(B) 6C97
VIDEO OUTPUT V-8(A) 6AW8
SYNC SEPARATOR V-5(B) 6AW8
SYNC PHASE INVERTER V-3(B) 6U8
HORIZONTAL CONTROL TUBE V-9(A) 6CQ7
HORIZONTAL OSCILLATOR V-9(B) 6CQ7
AUDIO OUTPUT V-8 6AQ5
SOUND DISCRIMINATOR AND AUDIO AMPLIFIER V-4(A) 6T8 V-4(B) 6T8
SOUND LIMITER V-3(A) 6U8
RADIO CONVERTER V-6 6BE6
RADIO I.F. AMPLIFIER V-7 6BA8
VHF TUNER 470936
UHF CHASSIS ONLY
PTOF RADIO CHASSIS
PTOF TUNER
PTOF UPRIGHT CHASSIS
CONTRAST CONTROL
BRIGHTNESS CONTROL
VOLUME CONTROL
HORIZONTAL HOLD CONT.
VERTICAL HOLD CONTROL
VERTICAL SIZE CONTROL
VERTICAL LINEARITY CONTROL
HORIZONTAL DAMPER
CENTERING UNIT
ION TRAP
FOCUS CONTROL

EMERSON MODELS
1232 (Ch.120331-H)
1233 (Ch.120332-R)

SCHEMATIC COURTESY OF EMERSON RADIO AND PHONOGRAPH CORPORATION



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